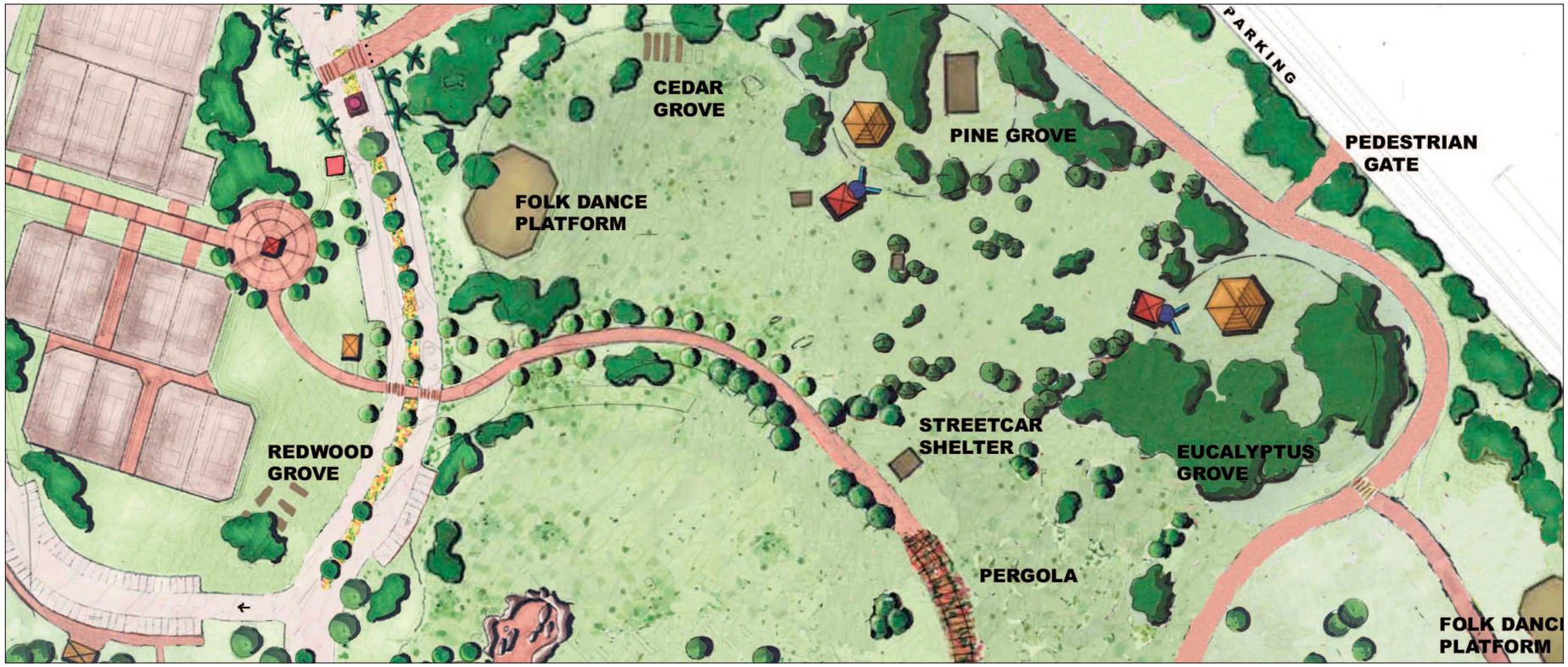
ROEDING PARK



FACILITY MASTER PLAN

Revised June 2009

TABLE OF CONTENTS

PLANNING PARTICIPANTS

City of Fresno Parks, After School Recreation and Community Services
Rotary Storyland and Playland
Fresno Chaffee Zoo Planning Team
Fresno Chaffee Zoo Board of Directors
Fresno County Zoo Authority

MASTER PLANNING CONSULTANTS

CLRdesign Inc.	Architecture, Landscape Architecture and Exhibit Design
Schultz & Williams, Inc.	Strategic Planning
Blair Church Flynn	Civil Engineering
Taylor Teter Partnership	Gas & Electric Engineering

PREPARED FOR:

City of Fresno Parks, After School Recreation and Community Services
2326 Fresno Street
Room 101
Fresno, California 93721-1824

Randall L. Cooper, Director
Jerry Haynes, Assistant Director

PREPARED BY:

City of Fresno Planning and Development Department
2600 Fresno Street
Fresno, California 93721

This document was prepared by the Fresno Chaffee Zoo and their consultants
Bonnie Sevy Koeppel and Dirk Poeschel Land Development Services, Inc. in June, 2009.

EXECUTIVE SUMMARY

BACKGROUND

In November of 2004, 73.4% of all Fresno County voters supported the passage of Measure Z. The purpose as detailed in the official ballot description of Measure Z was as follows:

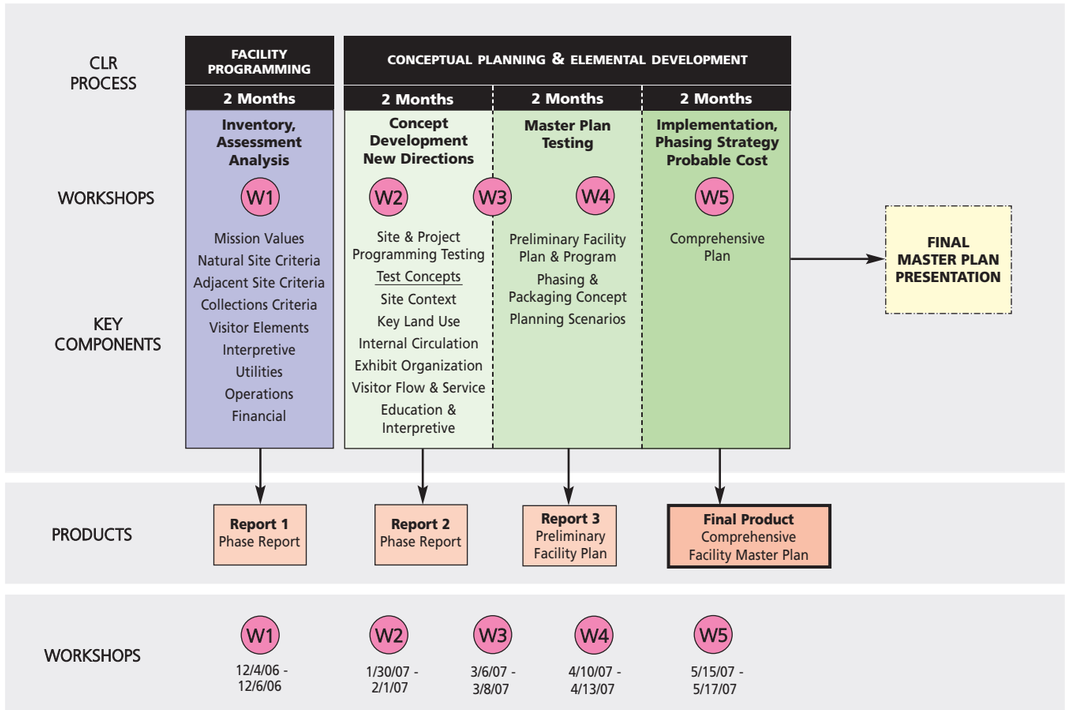
COUNTY OF FRESNO SAVE OUR ZOO, MEASURE Z.

To help ensure survival of the Chaffee Zoo by providing necessary funding to repair and restore the zoo, bring back large animal exhibits, further revitalize the zoo, and preserve the zoo's Species Survival Plan and ongoing Education Program shall Fresno County voters approve a one-tenth of one percent sales tax for ten years with all net proceeds dedicated exclusively to the Chaffee Zoo?

Subsequent to passage of the measure, in July of 2007 the *Roeding Park Facility Master Plan Draft Final Report* was developed.

The 2007 Facility Master Plan Draft Final Report represented a collaborative effort between several firms and disciplines and incorporates the input of many individuals from the Fresno Chaffee Zoo, the City of Fresno Parks, After School Recreation and Community Services (PARCS) and Rotary Storyland and Playland. The Zoo and PARCS commissioned CLRdesign – architects and landscape architects, Schultz & Williams, Inc. – strategic planners and Blair Church Flynn (BCF) – consulting engineers to prepare the Master Plan documents for Roeding Park (Park) and the Fresno Chaffee Zoo (Zoo). Although the planning process for these Master Plans occurred concurrently, both the Park and Zoo Facility Master Plans (hereafter RPFMP and FCZFMP) exist as stand alone reports.

After further evaluation of project objectives in February 2008 the *Roeding Park Facility Master Plan Final Report* was prepared and presented to the Mayor and City Manager's Office for acceptance.



Planning Process Diagram

Neighborhood Context Map

PROCESS

The 2008 version of the Roeding Park Facility Master Plan (RPFMP) was used as the primary document to describe the project for submittal and review of the project Conditional Use Permit (CUP) and preparation of the related Environmental Impact Report (EIR). The project EIR identified certain potential issues that could be mitigated by revising the project. Based on meetings with City of Fresno planning staff and project consultants, city staff revised the project as detailed in this document. This Facility Master Plan represents a collaborative effort to deliver an environmentally sensitive, commercially successful project that provides a unique education and entertainment experience to the region.

Throughout the initial eight-month Planning Process (see graphic diagram on previous page), several new ideas and concepts were generated with the help of the Zoo Planning Team along with many groups and individuals representing Roeding Park including Rotary Storyland and Playland, and the City of Fresno PARCS. During the initial stages of the Planning Process, consultants facilitated workshops with the full Planning Team to discuss key broad issues such as land use, circulation, Park access and city and regional context. During the later stages of the Planning Process, special focused discussions were conducted with the Park, Zoo, Playland and Storyland to discuss site-specific issues and new development concepts.

Inventory, Assessment & Analysis

During the first phase of the Planning Process, CLR and BCF collected as much relevant site data as possible. Maps were prepared to document existing patterns of circulation, site access and parking, land use, land form, visitor services, visitor experiences, operations facilities, exhibits and attractions, vegetation and utilities. These maps were then used to identify the positive and negative attributes of the site.

Concept Development

Utilizing the collected site inventory data and conclusions reached during the first phase of the Planning Process, several new land use and circulation concepts were developed that incorporated the 21 acre Zoo expansion. Creating a simplified vehicular and pedestrian circulation system throughout the Park and Zoo, with an expanded main parking hub, was a key driver in the spatial organization of the Facility Master Plan. Preliminary land use concepts were also generated during this phase that proposed new areas for recreation and green space for the Park, and new exhibits, attractions, strategic services, and operations facilities for the Zoo.

Master Plan Testing - Test Concepts

All illustrations of the RPFMP were presented for review, comment and revision during this phase of the process. Preliminary phasing and project packaging concepts were developed to test various implementation and strategic return on investment scenarios and may change due to a variety of circumstances.

Implementation

During this final phase of the design process, this revised Facility Master Plan was prepared, which provides a road map for how the Plan can be carried out through a prioritized sequence of project implementation. For the Park, including Rotary Storyland and Playland, the Master Plan provides a flexible framework for both improvements and growth. The Zoo Master Plan proposes a comprehensive redevelopment and expansion strategy through year 2020, with a strong focus on the "Measure Z" implementation plan through year 2014.

MASTER PLAN OBJECTIVES

The primary objective of the RPFMP, including Playland and Storyland, is to provide a comprehensive roadmap for future development over the next 10-20 years.

Fresno Chaffee Zoo Facility Master Plan Background

In 2005, Fresno County residents passed “Measure Z” which will provide the Zoo with a total of $120M through 2014. $40M of Measure Z funding is dedicated towards supporting Zoo operations, which leaves $80M available for capital projects. The primary objective of the Fresno Chaffee Zoo Facility Master Plan (FCZFMP) is to provide a comprehensive roadmap for future development, with a special focus on Measure Z packaging, phasing and implementation through 2014.

ROEDING PARK OVERVIEW

Roeding Park, one of three regional city parks in the City of Fresno, is located on Belmont Avenue next to Freeway 99 and attracts 600,000 visitors annually. The Park, at 148 acres, includes the Chaffee Zoo, Rotary Storyland and Playland amusement parks, eight tennis courts, picnic areas and playgrounds, and several other activity areas and amenities. The Storyland and Playland amusement parks, located at the southwest corner of the Park, are operated by the local area Rotary clubs. Storyland, which is geared towards younger children, includes several interactive exhibits themed after well known stories and fairy tales. Playland includes a carousel, roller coaster, train ride and other rides, attractions and concessions. There are mature groves of trees, including species of ash, pine, eucalyptus, maple, redwood, palm and cedar, located throughout the Park.

MASTER PLAN DRIVERS

Circulation

- Eliminate redundant Park and Zoo roads and paths to maximize landscape and Park attraction land use.
- Develop a more organized and simplified visitor circulation/wayfinding system.
- Provide better visitor amenities with plenty of options for cooling and shade.

Land Use

- Preserve existing valuable trees wherever possible and develop reforestation plan.
- Improve existing botanical displays and create organized campus horticulture plan.

Arrival and Entry

- Create a centralized parking hub for Roeding Park that can accommodate peak days.
- Drastically improve vehicular and pedestrian circulation throughout the Park.
- Create a distinct, memorable gateway experience when entering the Park.
- Reconstruct the Zoo, Playland and Storyland entry zones to be more user-friendly and easier to find.

Visitor Amenities

- Improve amenities including shade, benches, picnic and play areas and restrooms.
- Improve picnic and event (corporate, weddings, etc.) facilities.
- Create new attractions/amenities that encourage longer stay times.

Mission Drivers

- Become a destination attraction for the City of Fresno.
- Provide stewardship of the public open space and recreation areas within the existing Park.
- Acknowledge Park features linking events, activities, cultural or aesthetic values, buildings or structures which provide valuable insight into potential historic periods and patterns of Park development.
- Create unique experiences that distinguish Roeding Park from Woodward Park and other nearby recreation sites.
- Facilitate the expansion of the Fresno Chaffee Zoo in as efficient, phased and environmentaly sensitiave manner.

KEY MASTER PLAN CONCEPTS

1. Main parking hub for Park, Zoo, Playland and Storyland.
2. Pedestrian promenades and plazas at key activity zones.
3. Preserve existing mature trees and develop reforestation and botanical plan.
4. Main centralized Park activity plaza for daily use and community events.
5. Themed gardens and trails link to the promenade concept.
6. Centralized 10 acre+/- lawn for passive recreation and events.
7. Parking nodes distributed throughout the Park at key activity zones.
8. Enhanced picnic stations and play equipment for different age groups.
9. New grand vehicular boulevard and Park entry gateways.
10. Enhanced visibility and linkages to the Zoo, Playland and Storyland entry gates.

Illustrative Roeding Park Facility Master Plan
Revised June 2009

1 ACRE

0′ 150′ 300′ 600′

N

LEGEND

- Illustrative Proposed Site Boundaries

BUILDING
- Visitor Service Facility
- Exhibit Facility
- Animal Holding & Support Facility
- Zoo Service & Operations Facility

CIRCULATION
- Primary Zoo Path & Plazas
- Entry Plazas & Promenades
- Park Plaza & Promenades
- Vehicular Circulation, Parking & Service

SITE
- Animal Exhibits
- Zoo Buffer
- Park Landscape

Implementation Schedule

The Implementation Schedule shown on the following page proposes three major phases of Park project implementation which are "Measure Z" Park/Zoo Shared Infrastructure projects, Independent Park projects and Independent Zoo projects. The list of "Measure Z Park/Zoo Shared Infrastructure Projects are projects which agreeably are of mutual benefit to the City and Zoo. These projects will improve the existing infrastructure systems of parking, vehicular circulation and storm water management.

The proposed list of RPFMP Independent Park projects was developed to provide enhancements to public open space. The independent Park improvements will be new or rehabilitated attractions or amenities.

The proposed Independent Zoo projects are associated with the reconstruction of the Zoo entrance, visitor amenities, creating habitat, exhibits and attractions, zoo operations and maintenance. Further description of these projects can be found in the Fresno Chaffee Zoo Facility Master Plan.

The design, construction and opening dates proposed for all projects is based on a balanced approach of implementing infrastructure and plan implementation projects. The proposed budgets and opening dates are not supported by the Implementation Plan or based on real construction dollars available for these projects. Therefore the project will be phased.

It is expected that the RPFMP phasing schedule may change over time based upon resource constraints and opportunities that become available as implementation of the Master Plans proceed.

Master Plan Diagram

Shared Park/Zoo Infrastructure Projects

The proposed Park/Zoo Infrastructure Projects, as shown in this diagram, are scheduled to be implemented during the Measure Z phase of work (2007-2014). The new Entry Gate and Park Boulevard will drastically improve vehicular access and circulation throughout the Park. The new parking hub will provide 830 centralized parking spaces shared between the Park, Playland, Storyland and the Zoo. Currently, the Park has a total of 680 marked parking spaces located along the existing roadways and the small lot adjacent to the Zoo entry. With the addition of the new parking hub, Park Boulevard, which includes parallel parking, and the parking nodes, the Park will have a total of 1,345 visitor parking spaces.

Master Plan Projects Summary

BACKGROUND

The City of Fresno PARCS is committed to facilitating the orderly and efficient development and expansion of the Zoo. In addition, the Park has plans to enhance the area under its purview.

Some improvements will mutually benefit the Park and the Zoo and will be shared between the two entities. Further details about financing, construction scheduling and design must be developed. As part of the shared expenses, the Zoo intends to provide the design and construction standards for the Zoo and other major area components to assure consistency with the Park and Zoo project objectives enhance efficiency and achieve optimum visitor enjoyment.

Funding for Park improvements will come from the city's general fund, state park bond money, grants and sponsorships. Phasing of new construction will occur as funding, design and permitting is accomplished with a priority to complete the Measure Z improvements. To the extent practical, improvements will maintain the integrity of the Park's architectural and horticultural theme.

"MEASURE Z" PARK/ZOO SHARED INFRASTRUCTURE PROJECTS

Golden State Boulevard Entry Gate

New main visitor gate off of Golden State Boulevard to create a unique and more direct Park & Zoo entry experience.

PROJECTED OPENING: A first phase priority improvement to be coordinated with the Zoo construction schedule.

New Park Boulevard

Redeveloped main Park Boulevard with special signage, graphics, sculptures, landscape, lighting and pond relocation.

PROJECTED OPENING: A first phase priority improvement to be coordinated with the Zoo construction schedule.

Parking Hub

Expand centralized visitor parking area for shared Park and Zoo parking spaces.

PROJECTED OPENING: A first phase priority improvement to be coordinated with the Zoo construction schedule.

Relocated Park Maintenance Yard

Move the Park maintenance yard to the planned location at the northwest corner of the Park.

PROJECTED OPENING: A first phase priority improvement to be coordinated with the Zoo construction schedule.

Construct New Storm Water Storage Facility

Construct an off-site storm water storage basin. Uncouple the existing storm water system from the City of Fresno municipal sewage collection system.

PROJECTED OPENING: To be coordinated with the Zoo construction schedule and per the project engineer's recommendations.

Install New Water, Sewer, Gas and Electricity Services to the Park

Replace dilapidated infrastructure and construct new infrastructure where necessary.

PROJECTED OPENING: A first phase priority improvement to be coordinated with the Zoo construction schedule and per the project engineer's recommendations.

INDEPENDENT PARK PROJECTS

Parking Nodes & Roadway Improvement.

New visitor parking nodes distributed throughout the Park. Park roads to remain.

PROJECTED OPENING: 2012 or thereafter as funding is available.

Perimeter Fencing & Landscaping

Replacement and enhancement to the perimeter park fencing and edge landscapes.

PROJECTED OPENING: 2012 or thereafter as funding is available.

Park Plaza Hub & Show Gardens

Central plaza hub, fountain and show gardens that will serve as the primary gathering space at the center of the Park.

PROJECTED OPENING: 2012 or thereafter as funding is available.

Great Lawn

Enhanced Great Lawn at the center of the Park.

PROJECTED OPENING: 2012 or thereafter as funding is available.

New Dog Park

Relocate the existing leash free dog park to the planned location.

PROJECTED OPENING: 2012 or thereafter as funding is available.

Pedestrian Promenade & Hubs

Develop new pedestrian paths and a plaza that could include site/architectural amenities such as sculpture, benches, ornamental pedestrian scale lighting and drinking fountains.

PROJECTED OPENING: 2012 or thereafter as funding is available.

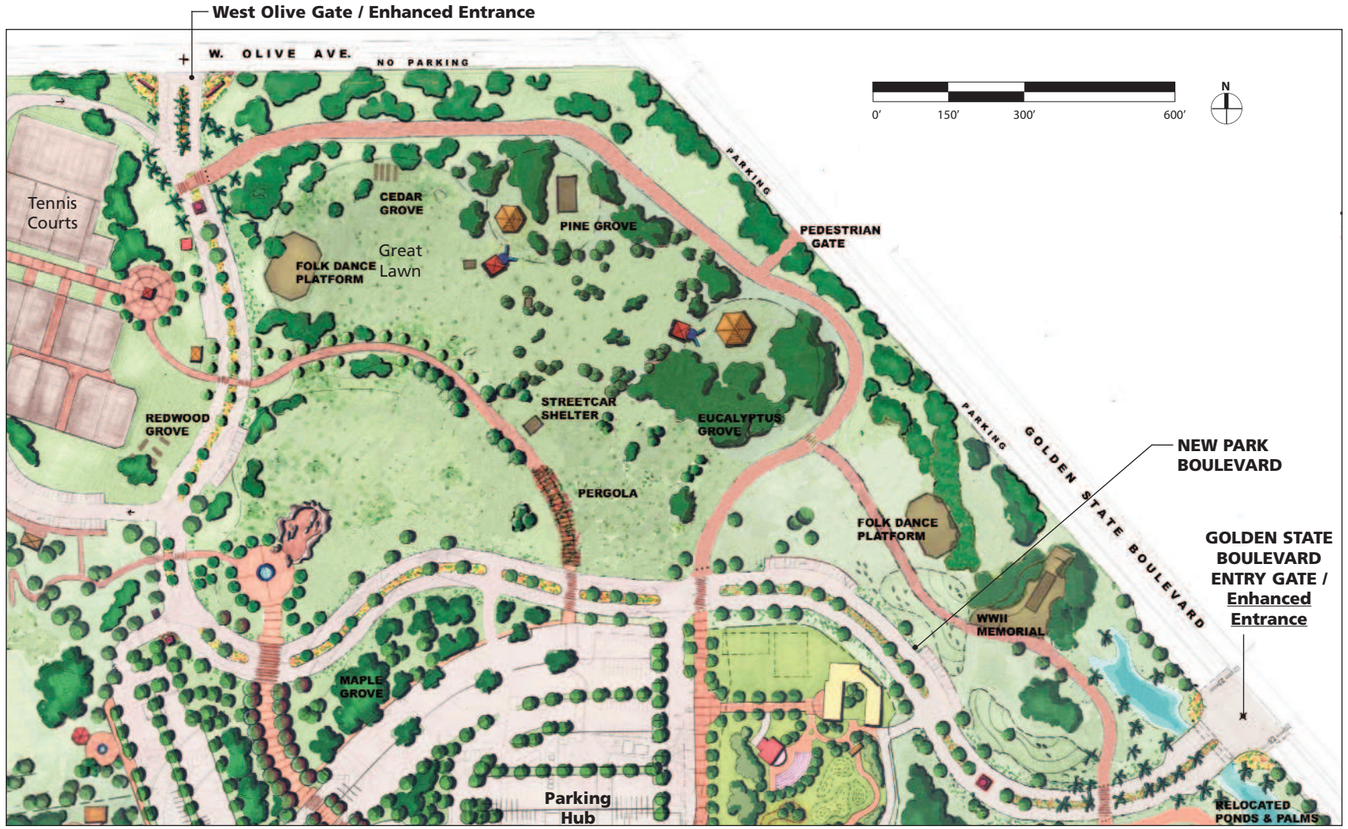
Sculpture Gardens

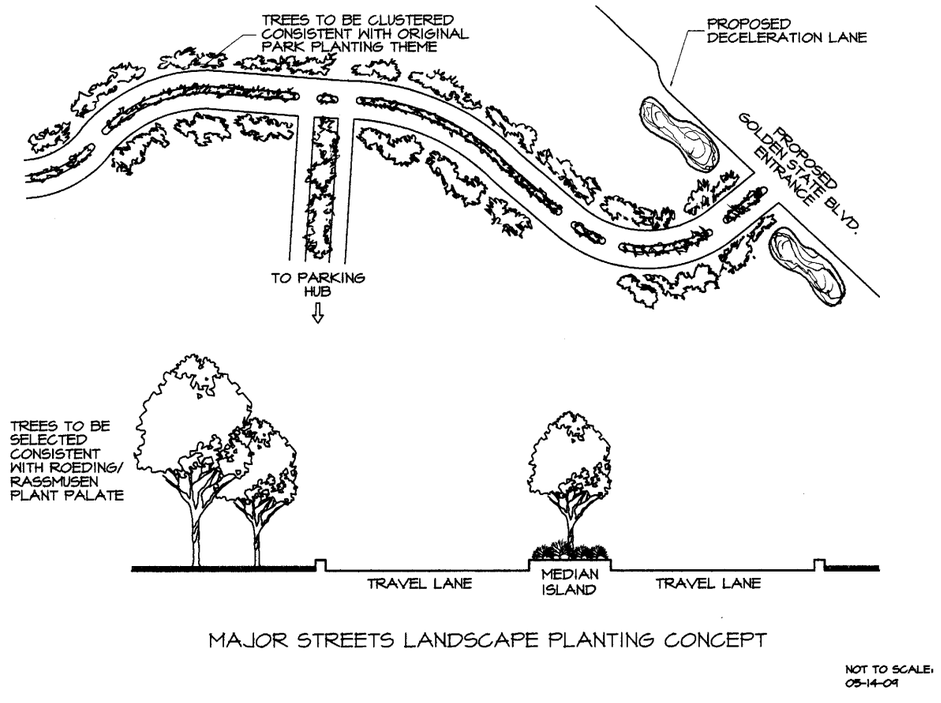
Special themed landscaping, special plantings or sculpture that would be unique and distinguish Roeding Park from Woodward Park or other nearby recreation areas.

PROJECTED OPENING: 2012 or thereafter as funding is available.

MASTER PLAN PROJECTS

New Park Boulevard & Golden State Boulevard Entry Gate





MAJOR STREETS LANDSCAPE PLANTING CONCEPT

NOT TO SCALE:
05-14-09

NEW PARK BOULEVARD TEST CONCEPTS

- Redeveloped Park Boulevard to serve as the primary vehicular corridor through the Park, providing direct access to the central parking hub, drop-off zones for the Park, Zoo and Playland/Storyland and multiple parking nodes stationed at key Park activity zones.
- The Park Boulevard is proposed to reuse existing Park road infrastructure wherever possible to minimize costs and reduce the amount of landscape/tree disturbance.
- A generous right of way is proposed that would allow for parallel parking along the shoulders (where possible), a planted ~15' wide median and tree lined edges planted in clusters generally utilizing trees species originally planted at the Park.
- Main access points would occur from the proposed Golden State Boulevard entry gate and the existing West Olive Avenue entry gate. Pedestrian access could still occur at the existing entrance on Belmont Avenue and at a proposed pedestrian gate on Golden State Boulevard.
- The Park ponds may be relocated in phases for the development of animal exhibits and to enhance the proposed entry on Golden State Boulevard. Relocated ponds will be reconstructed in a manner and style consistent with the historic character of the project and to provide interpretative reference to the historic location of the ponds in the project. Water features of the animal exhibits and reconstructed ponds can be used to achieve a no net loss of pond area.

GOLDEN STATE BOULEVARD ENTRY GATE TEST CONCEPTS

- New grand Park & Zoo entry gate off of Golden State Boulevard.
- New entry signage, graphics and a scrolling marquee/gateway sign that would announce special events and happenings at the Park, Zoo and Playland/Storyland.
- Special themed landscape (landform berms, special planting, sculpture, etc.) that would be unique and distinguish Roeding Park from Woodward Park and other nearby recreation sites.

Animal sculpture could be included at the Park entry gates and along the Boulevard to create a unique park experience.

Parking Hub and Storm Water Management

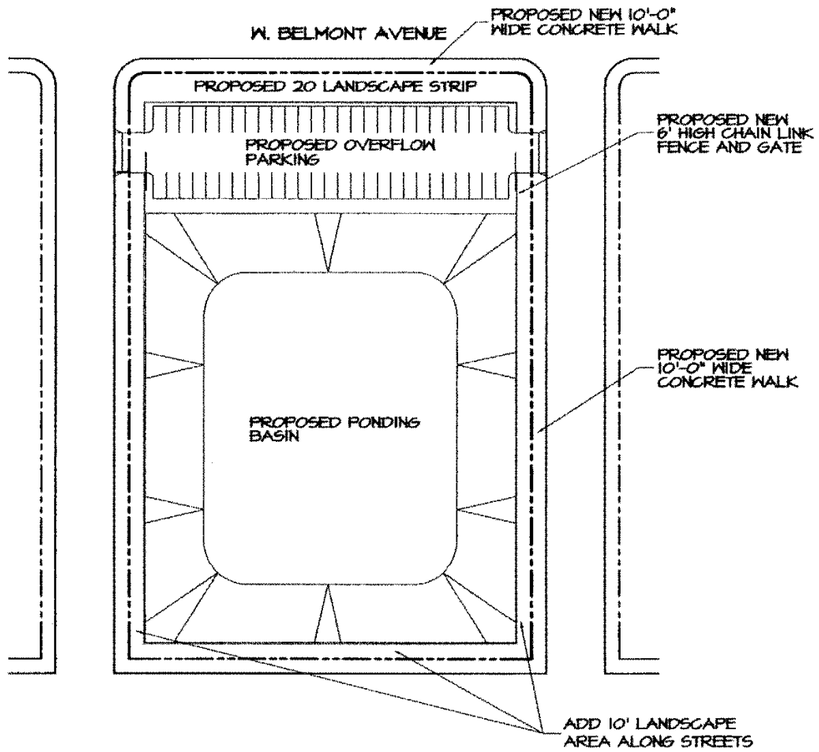
STORM WATER DRAINAGE

The initial environmental review process suggested that potential impacts to landscape, historical and open space resources could be substantially reduced by moving the proposed storm water retention basin from its planned location northerly of Storyland to a location outside of the Park. A conceptual analysis of basin location alternatives determined that a good drainage retention basin site was available southerly of the park on a 3.7 acre vacant parcel, south of Belmont Avenue.

A retention basin located southerly of the Park will provide storm drainage system hydraulic efficiencies compared to a basin located within the Park; with a resulting significant storm drainage system construction cost savings estimated to range from $1,300,000 to $1,700,000. In addition, long term cost savings for operations and maintenance would result because the new basin site would not require the storm drainage pump station needed for the park site retention basin location. Estimated basin acquisition costs in the range of $200,000 to $350,000 have not been included in the operations, maintenance and construct cost savings estimates.

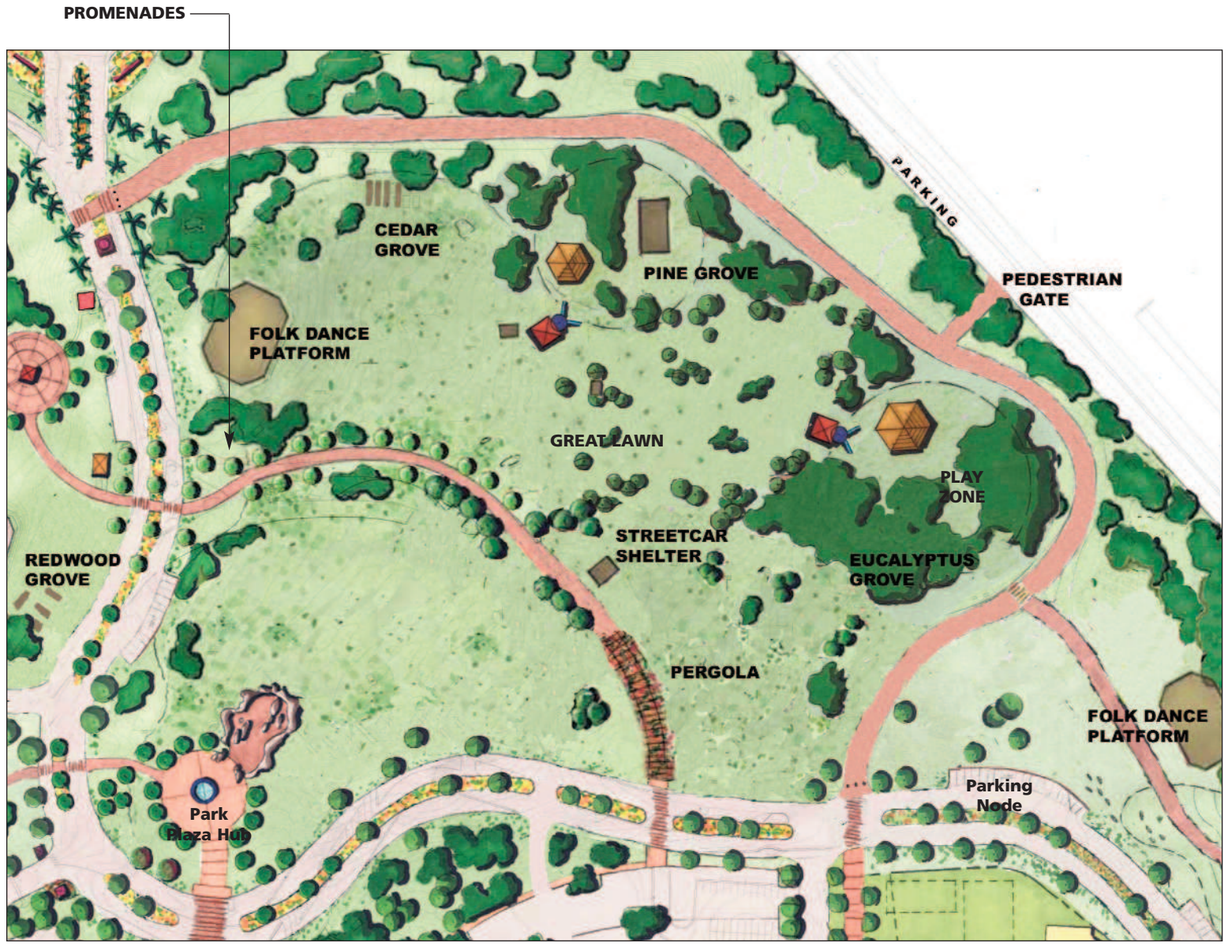
PARKING HUB TEST CONCEPTS

- Centralized shared parking hub for up to 830 parking spaces (includes use of the existing Park Operations site).
- Pave over existing parking zones wherever possible to minimize site disturbance.
- Save existing trees wherever possible by creating vegetated pockets within the parking zones. The existing grove to the northeast of the Operations Site should be retained.
- Low Impact Development (LID) strategies should be considered to manage storm water on-site as much as possible. Some LID strategies include porous paving, bio-swales (vegetated swales), rain gardens, infiltration trenches.
- Promenades and paths that provide easy and comfortable access to the Zoo, Park and Playland/Storyland.



CONCEPTUAL PONDING BASIN DESIGN

Park Plaza Hub, Picnic Groves, Play Zones and Great Lawn



PARK PLAZA HUB TEST CONCEPT

- Central plaza hub and fountain to serve as the primary gathering space at the center of the Park.
- Central plaza hub situated at the relative high point of the Park.
- Site furnishings (benches, water fountains, trash/recycling receptacles, etc.), pedestrian scale lighting, flags/banners, graphics, and signage.
- Linkages to the Park promenades (which provide access to the key Park attractions).
- Existing pergola and steps to remain.

PICNIC GROVES AND PLAY ZONES TEST CONCEPTS

- Picnic groves including new shade pavilions, tables/chairs and tot play equipment.
- Located within existing tree groves to provide shade.
- Located within proximity of secondary Park roads and parking nodes.

GREAT LAWN TEST CONCEPT

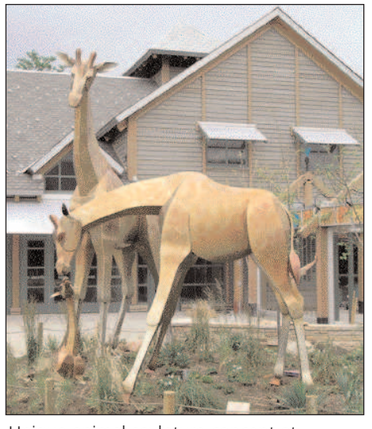
- Large, centralized lawn area that could be used for passive recreation, concerts, events and more.

Sculpture Gardens / New Dog Park

Leash-free dog park concept

NEW DOG PARK TEST CONCEPTS

- New fenced-in zone(s), leash free dog park.
- Exercise loops and equipment/amenities.
- Located within close proximity of secondary Park road and parking node.
- Trash/recycling receptacles, hand wash station, benches and other amenities.

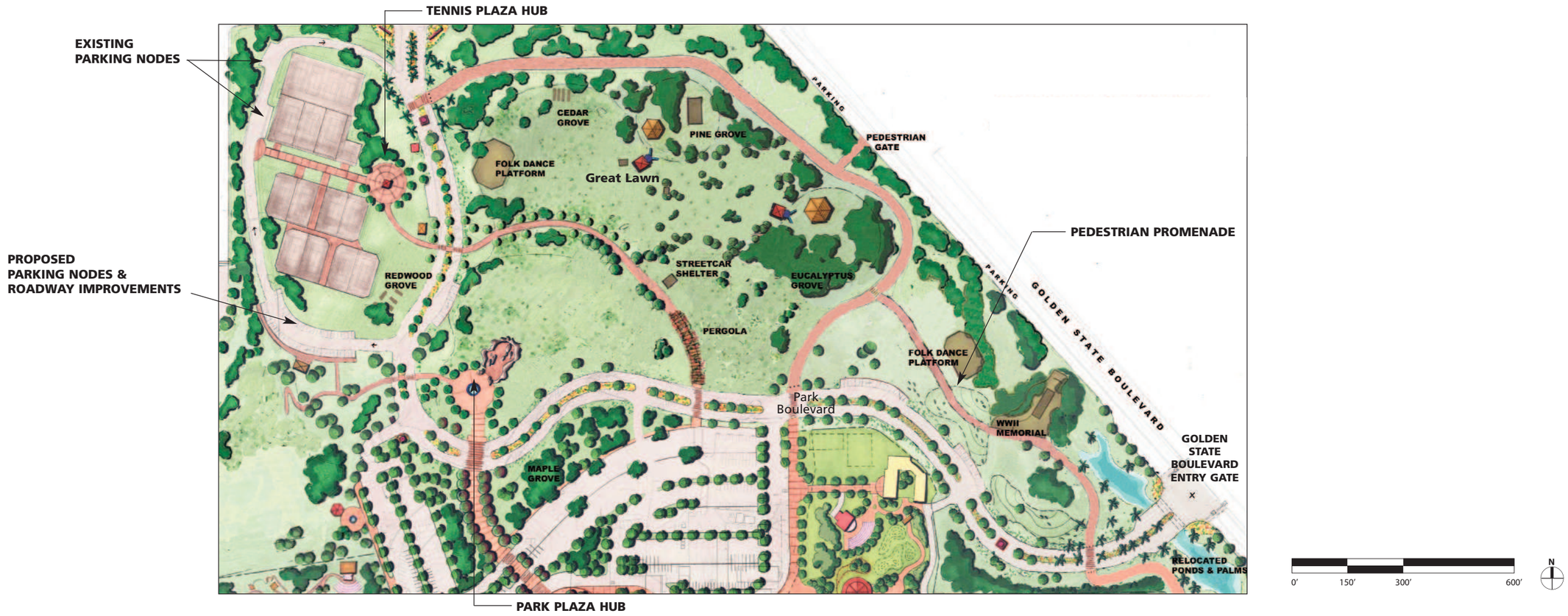


Unique animal sculpture concept at Sculpture Gardens

SCULPTURE GARDENS TEST CONCEPTS

- Special themed landscape, special plantings, sculptures etc. that would be unique and distinguish Roeding Park from other nearby recreation sites.
- Located adjacent to the proposed Golden State Boulevard Entry Gate, this garden zone would be one of the first attractions visible from the new Park Boulevard.
- New plaza hub located at this zone linked to the Park promenade circulation systems.
- Themed, walk-thru botanical and show gardens could be located at this zone.

Parking Nodes and Roadway Improvements
Perimeter Fencing and Landscape
Pedestrian Promenades and Hubs



PARKING NODES AND ROADWAY IMPROVEMENTS TEST CONCEPTS

- New visitor parking nodes distributed throughout the Park and Zoo near new proposed amenities/attractions.
- Enhance and repave existing Park roads to remain.
- New vehicular and pedestrian scale lighting where required.
- New pedestrian scale amenities such as benches, water fountains, shade trellises, trash and recycling receptacles, way-finding signage and lighting.
- Existing parking nodes will be utilized for temporary parking and loading.

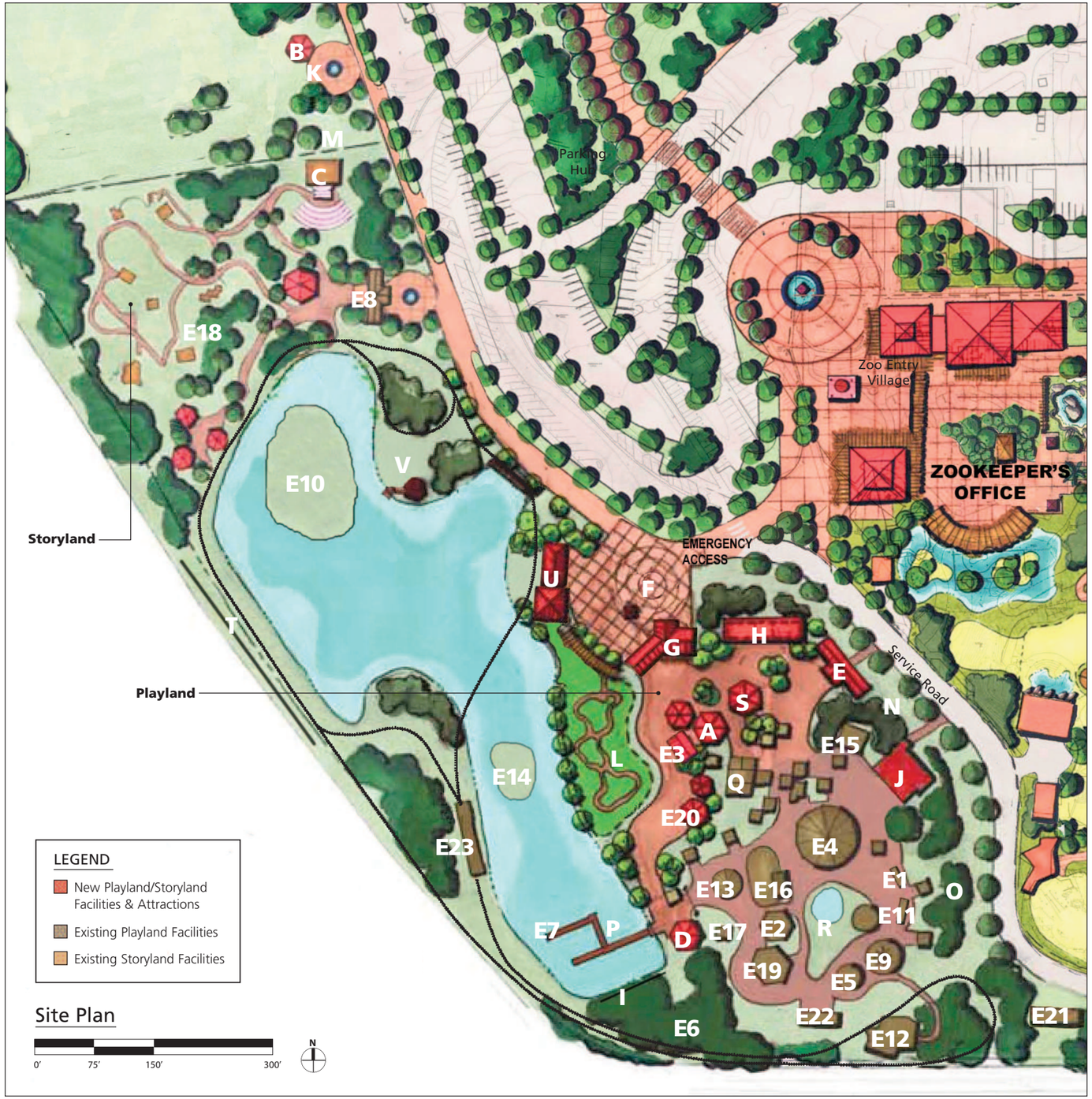
PERIMETER FENCING AND LANDSCAPE TEST CONCEPTS

- Upgrade perimeter Park fencing overtime to improve security, enhance the appearance of the Park edges and to match a common architectural style.
- Improve the landscape/planting zones at the edges to screen/buffer in some areas and be more inviting at other areas.
- Include unique Roeding Park sculpture/artwork at Park edges.

PEDESTRIAN PROMENADES AND HUBS TEST CONCEPTS

- 15' wide paved path that could also include site/architectural amenities such as sculpture, benches, ornamental pedestrian scale lighting, signage and drinking fountains.
- Plaza Hubs (Sculpture Garden Hub, Tennis Hub, and Rock Climbing Hub) located at key attraction zones throughout the Park.
- Plazas could include fountains, seat walls, sculpture, drinking fountains, lighting, benches, trellises and more.
- Shade trees and border plantings flanking the edges of the promenades and plazas to reinforce the circulation patterns, provide visual interest and provide shade.

Playland and Storyland



NEW

- A 3D Theater
- B Amphitheater
- C Amphitheater Expansion
- D Boat House
- E Concession
- F Gateway
- G Entrance Playland & Golf
- H Ferris Wheel
- I Fishing Village Facade
- J Indoor Facility
- K Main Entrance
- L Mini Golf
- M Native American Village
- N Picnic
- O Picnic/Assembly
- P R.C. Boat Lagoon
- Q Restrooms
- R Splash Park
- S Toddler Playground
- T Town Facade
- U Train Station & Admin. & Restrooms
- V Public Picnic

EXISTING

- E1 Big Rocko
- E2 Bugs
- E3 Bungee
- E4 Carousel
- E5 Cars
- E6 Corp. Yard
- E7 Dock
- E8 Entrance
- E9 Helicopters
- E10 Island
- E11 Lil Rocko
- E12 Maintenance & Office
- E13 Octopus
- E14 Pirate Island
- E15 Restroom
- E16 Roller Coaster
- E17 Shade Structure (typ)
- E18 Storyland
- E19 Teacups
- E20 Tilt-O-Whirl
- E21 Train Display
- E22 Train Station
- E23 Tunnel

PLAYLAND TEST CONCEPTS

- New Entry Gateway for Playland that would be linked to an overall plaza zone for the Playland, Storyland and Zoo entry zones to the central parking hub.
- New anchor rides including a ferris wheel and roller coaster.
- Overall expansion of amusement park.
- 6-10 new smaller rides and/or attractions.
- New concession area and space for picnics and events.
- Expanded train loop and new train station location.

STORYLAND TEST CONCEPTS

- Overall expansion of amusement park.
- New mini-golf area with option for separate guest entry.
- Up to 6 new exhibit/attraction zones.
- Expansion of the existing amphitheater.
- New Entry Gateway for Playland that would be linked to an overall plaza zone for the Playland, Storyland, Park and Zoo entry zones to the central parking hub.

Existing Playland Entrance
An important concept in the overall Park Facility Master Plan is to create a more visitor friendly entry promenade and plaza zone that would link to the Zoo, Playland and Storyland entry zones. The existing Playland and Storyland entry gates could be redeveloped to improve the entry frontage on the proposed centralized Parking Hub, which would make it quicker and easier for visitors to find.

CONCEPTUAL FRAMEWORK

Parking and Visitor Flow

REVENUE HUBS

1 ZOO ENTRY VILLAGE
- Main Gift Shop
- Ticketing/Memberships
- Snack/Bakery
- Guest Services
- Restrooms/Comfort Station
- Seating/Trellises

2 CENTRAL PLAZA HUB
- Waterhole Café & Event Center
- Retail/Gift Option
- Restrooms/Comfort Station
- Panoramic Exhibit Views
- Shady Oasis with Seating

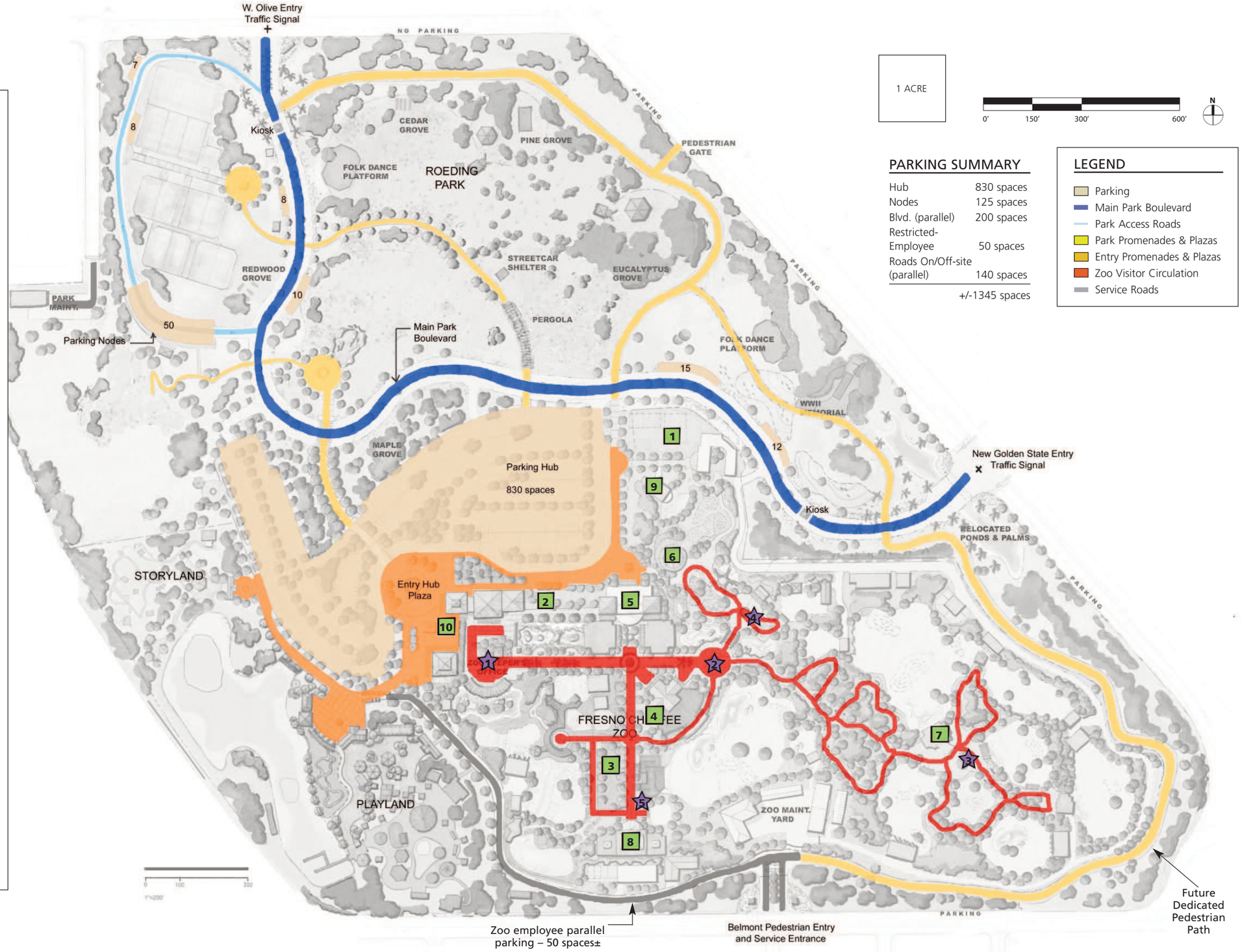
3 SAFARI TRAIL HUB
- Café (Seasonal)
- Retail/Gift Option (Seasonal)
- Restrooms/Comfort Station
- Shaded Decks with Exhibit Panoramas
- Climate Controlled Exhibit Building

4 CHILDREN'S ZONE
- Coffee/Ice Cream Station
- Carousel, Tot Train, Other Rides
- Kids Theater
- Restrooms/Comfort Station

5 SOUTH PROMENADE HUB
- Snack Cart Options
- Retail/Gift Option (Seasonal)
- Restrooms/Comfort Station

EVENT VENUES

1 MAIN EVENT HUB & LAWN
2 EVENT GROVE AT ENTRY
3 EVENT GROVE AT SOUTH ZOO
4 CENTRAL PLAZA HUB & WATERHOLE CAFÉ
5 ADVENTURE EDUCATION & D.O.L.
6 CAROUSEL
7 SAFARI TRAIL HUB CAFÉ
8 RAINFOREST AVIARIES
9 REDEVELOPED HISTORIC THEATER
10 ENTRY VILLAGE PLAZA



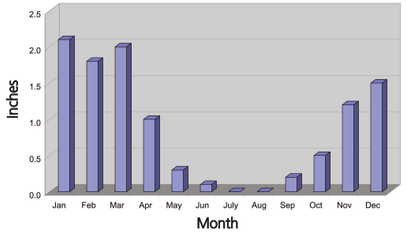
PARKING SUMMARY

Hub	830 spaces
Nodes	125 spaces
Blvd. (parallel)	200 spaces
Restricted-Employee	50 spaces
Roads On/Off-site (parallel)	140 spaces
	+/-1345 spaces

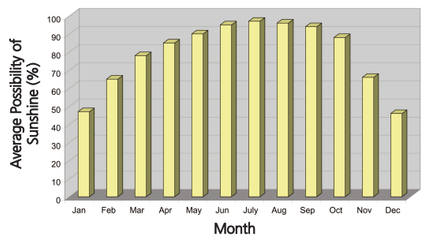
LEGEND

- Parking
- Main Park Boulevard
- Park Access Roads
- Park Promenades & Plazas
- Entry Promenades & Plazas
- Zoo Visitor Circulation
- Service Roads

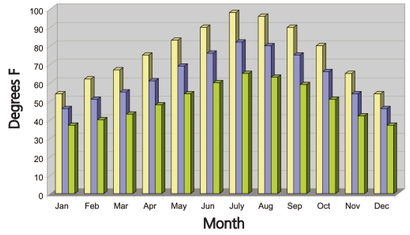
AVERAGE PRECIPITATION



AVERAGE SUNSHINE



AVERAGE TEMPERATURE



ENVIRONMENTAL FACTORS

The climatic graphs to the left show monthly averages for temperature, sunshine, and precipitation for Fresno, California. The following conclusions can be made based on this data:

1 Outdoor Animal Management/Exhibitry

Based on the monthly high temperatures (average yearly high temperature 76 degrees), most animals can remain outdoors during the day for up to 12 months per year. Appropriate shade is required during the hotter months.

2 Sun Energy

The high probability of sunshine throughout the year (average yearly possibility of sunshine 79%), especially during the summer, provides an opportunity to harvest sun energy with photovoltaics, and perhaps reuse the stored energy on-site.

3 Provide Shade

The high probability of sunshine, and higher temperatures during the summer months, suggests the need to provide plenty of shade for animals and visitors.

4 Minimize Water Consumption

The average amount of precipitation is 10.9 inches per year. Minimizing water consumption and maximizing the use of natural rainfall/greywater should be considered. Greywater reuse for the Park and Zoo may be an option.

5 Passive Cooling

Prevailing winds come predominantly from the west-northwest for most of the year. With a relatively low average relative humidity (78% AM, 41% PM) opportunities for passive cooling should be investigated.

CAMPUS ECOLOGY STRATEGIES

1 Manage storm water by constructing a new pond(s) to accept project storm water.

2 Create a Campus Ecology Hub to showcase the environmental building and site strategies and systems being utilized by the Park and Zoo. The new Adventure Education Pavilion could be the "Hub" and first "Green" facility on campus.

3 Develop recycling programs for the Park and Zoo. Create a designated zone for material storage for recycling and salvaged building materials for reuse.

4 Create information hubs throughout the campus to educate visitors on campus ecology and to interpret what the Park and Zoo are doing on-site.

5 The Park and Zoo will practice sustainable campus management.

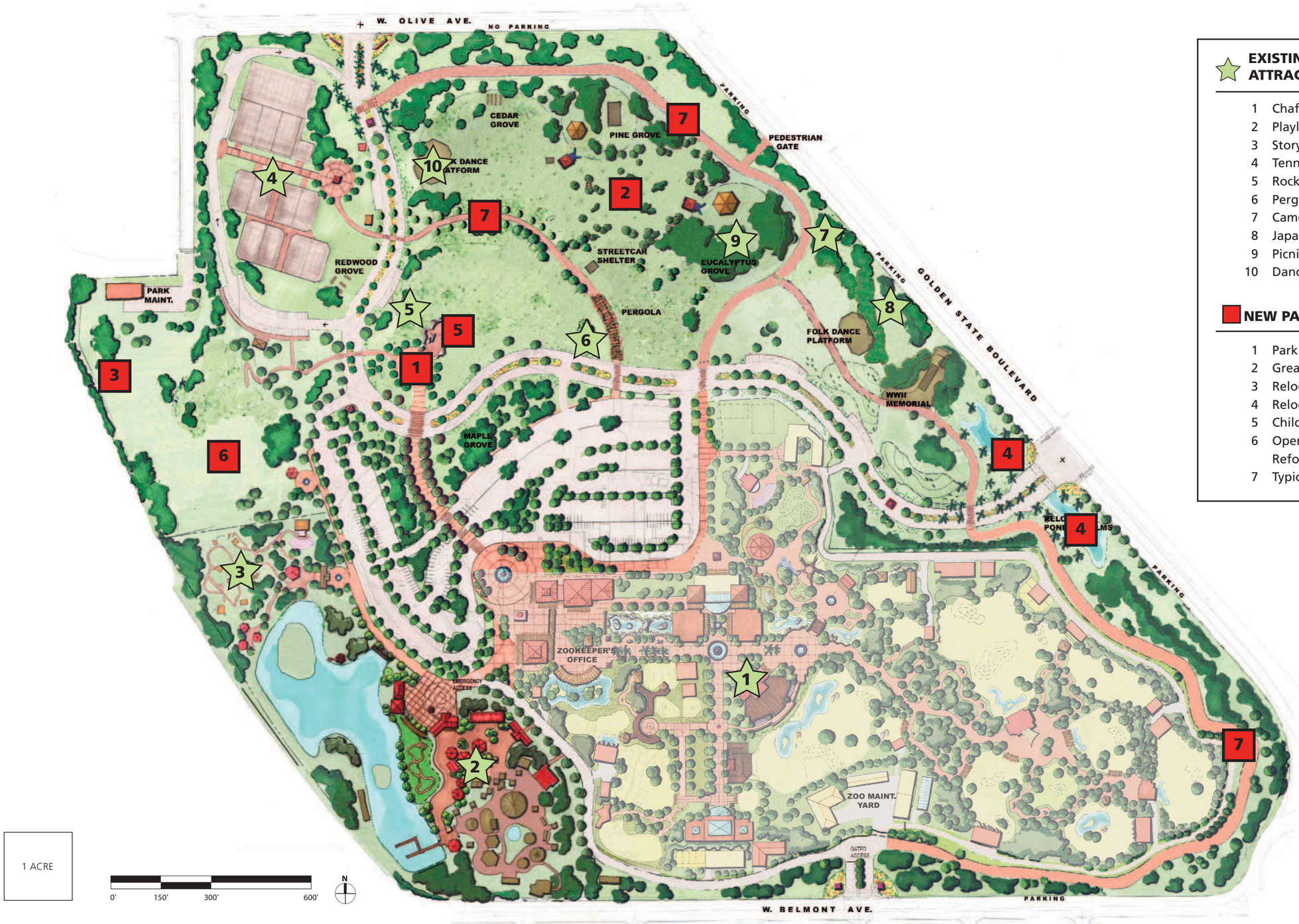
6 The project will incorporate the design, construction and operational features described in Fresno Green.

7 Incorporate "Best Management Practices" to address a wide range of environmental issues such as the recycling of waste, energy conservation, water use and ground water protection.

8 Develop a comprehensive landscape plan that, wherever possible, seamlessly incorporates existing Park and Zoo trees and features into the landscape design for the campus. Tree/plant selections and replacements should integrate with the look and character of the surrounding areas. Open space and recreational opportunities should be maximized.

9 To the extent practical, respect the integrity of the existing Park horticultural and architectural theme.

Park Attractions Plan



EXISTING ENHANCED PARK ATTRACTIONS/ACTIVITIES

1 Chaffee Zoo
2 Playland
3 Storyland
4 Tennis Courts
5 Rock Climbing Wall
6 Pergola
7 Camellia Gardens
8 Japanese-American Memorial
9 Picnic Groves
10 Dance Floor

NEW PARK ATTRACTIONS/ACTIVITIES

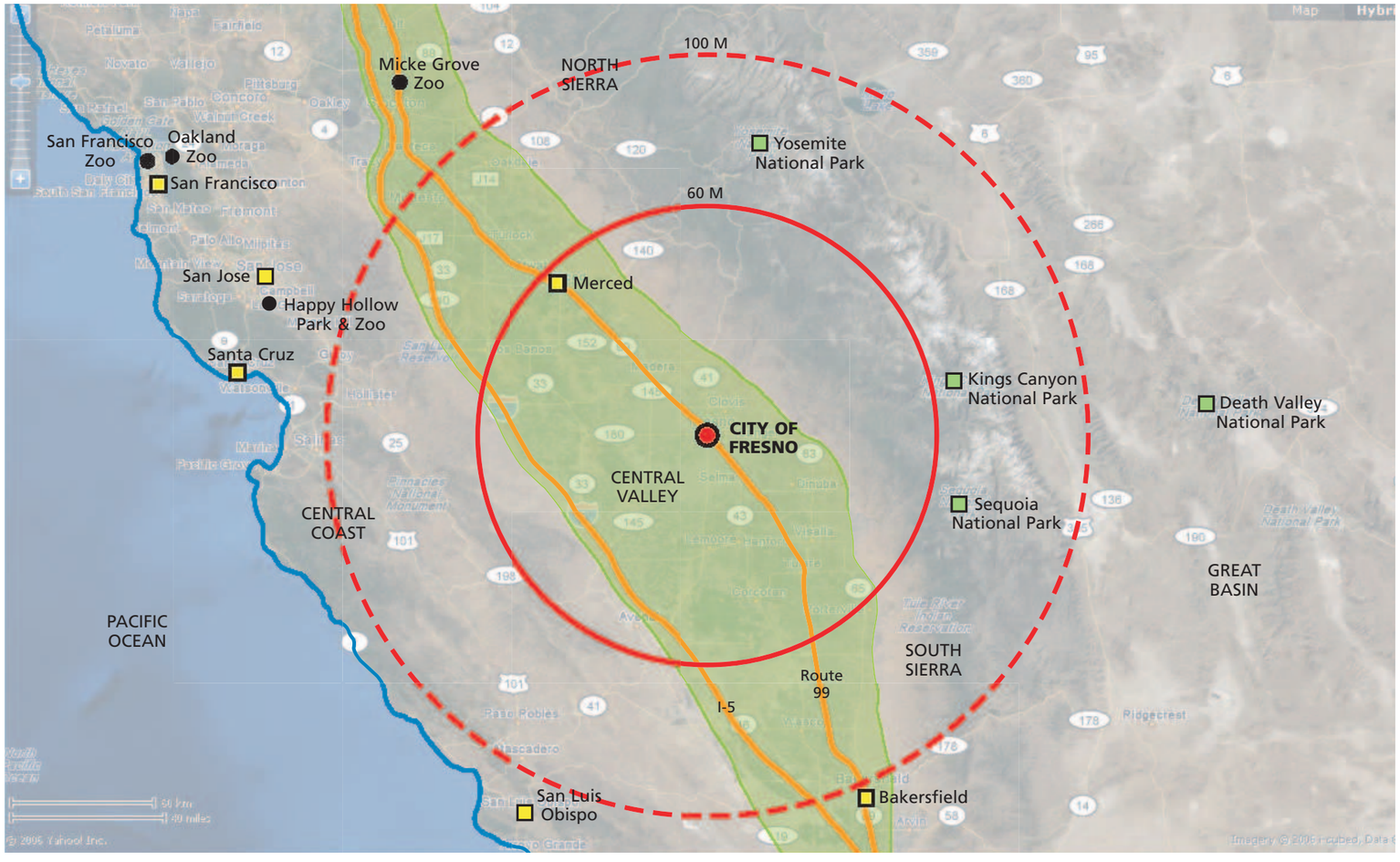
1 Park Plaza Hub
2 Great Lawn
3 Relocated Dog Park
4 Relocated Water Features/Fountain
5 Children's Play Area
6 Open Festival Area/Potential Reforestation Area
7 Typical Pedestrian Pathways

INVENTORY & ANALYSIS

REGIONAL CONTEXT

Roeding Park is located in the City of Fresno in Fresno County, California. The City of Fresno is located in California's Central Valley, approximately 160 miles southeast of San Francisco. The city is situated in the San Joaquin Valley, the southern-most part of the Central Valley, which lies between the Central Coastal Mountains to the east and the South Sierra Mountains to the west.

Located approximately 80 miles south of Yosemite National Park, Fresno is known as the 'Gateway to Yosemite.' With no other major city or attraction within a 60-mile radius, the City of Fresno and Zoo have the opportunity to be a destination attraction for tourists visiting the Central Valley.

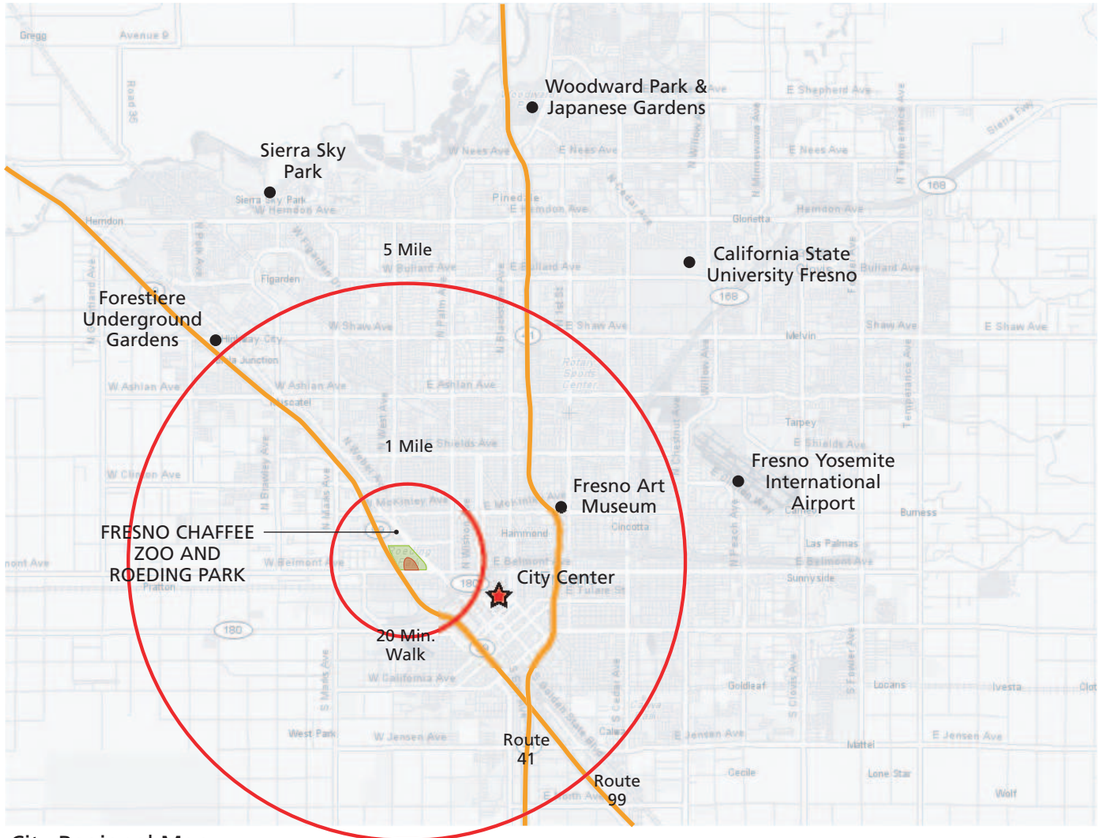


California Central Valley & Beyond – Aerial Photo

City and Neighborhood Context Mapping

CITY CONTEXT

Roeding Park is located at the southwest corner of the City of Fresno. The Park is bounded by West Olive Avenue to the north; West Belmont Avenue to the south; Golden State Boulevard to the east; and State Route 99 to the west, a state highway that runs N-S through California's Central Valley and acts as a major access route to Fresno.



City Regional Map

NEIGHBORHOOD CONTEXT

The surrounding context of Roeding Park includes residential to the south and east and mixed use to the north and west. Visitors can enter the Park from gateways at West Belmont Avenue and West Olive Avenue. Downtown Fresno is located approximately 2 miles southeast of the Park, off of State Route 99.

Neighborhood Context Map

Roeding Park Organization
Existing Condition

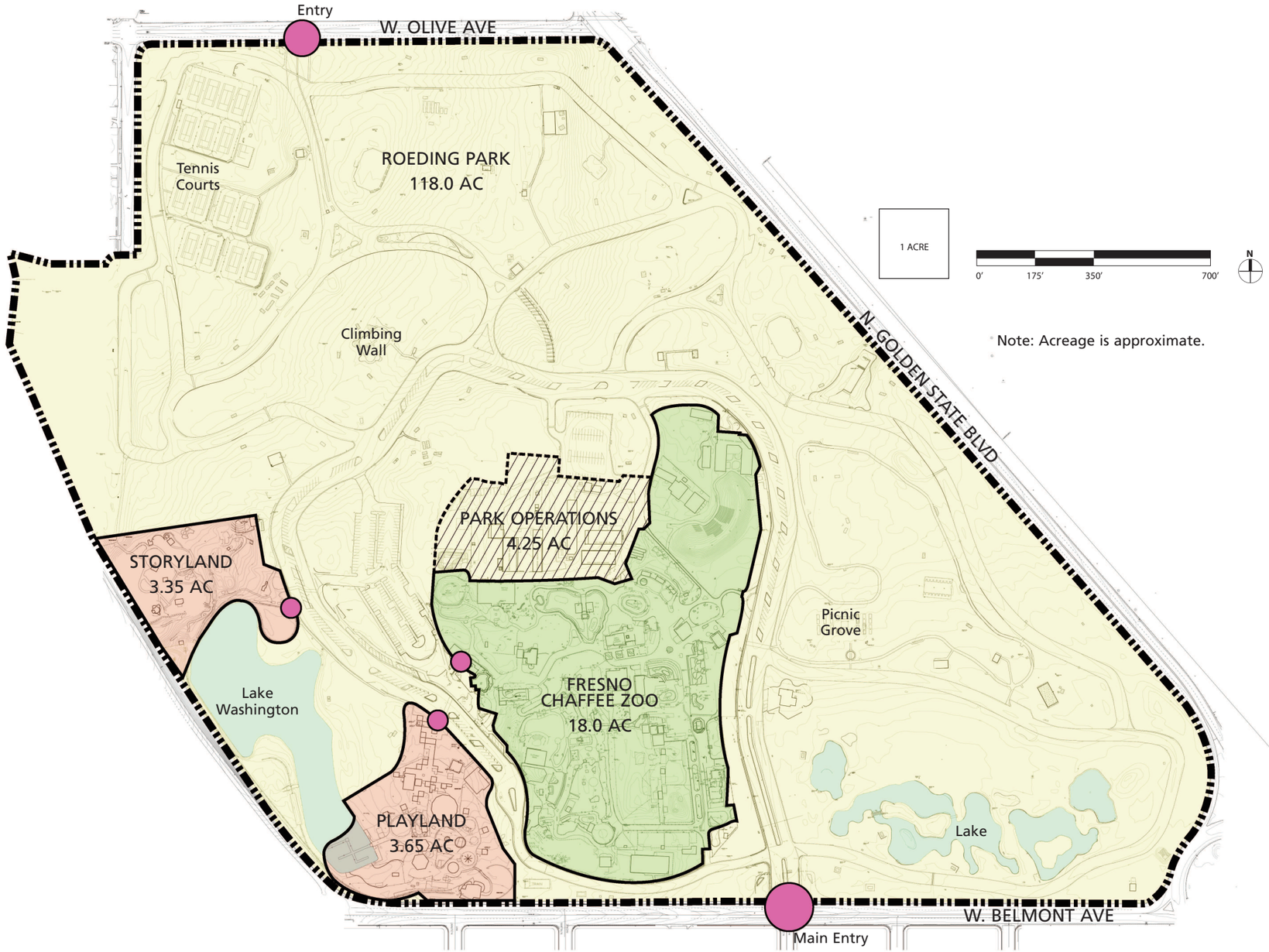
EXISTING SITE PHOTOS

Roeding Park Entry Gate

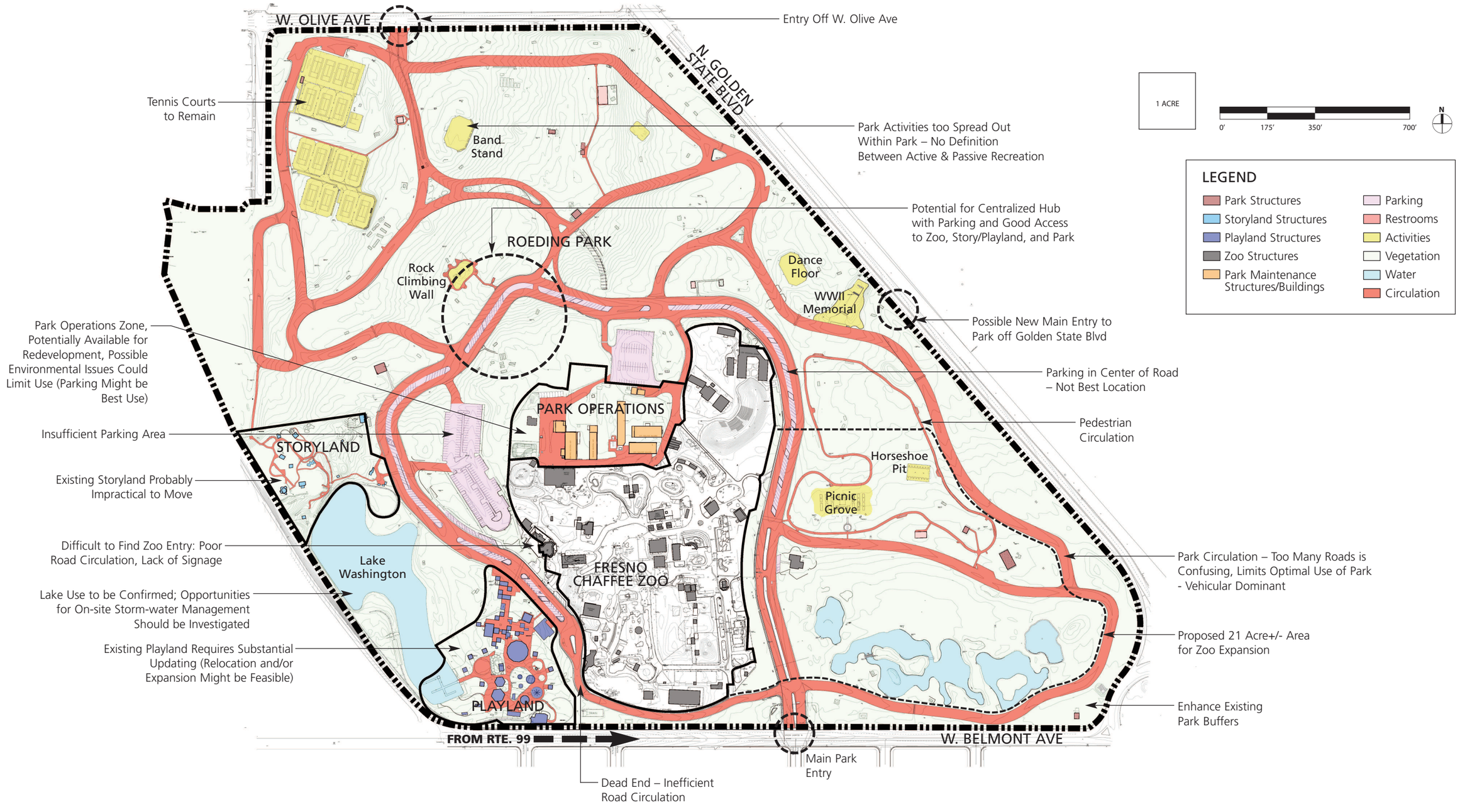
Chaffee Zoo Giraffe Feeding

Playland

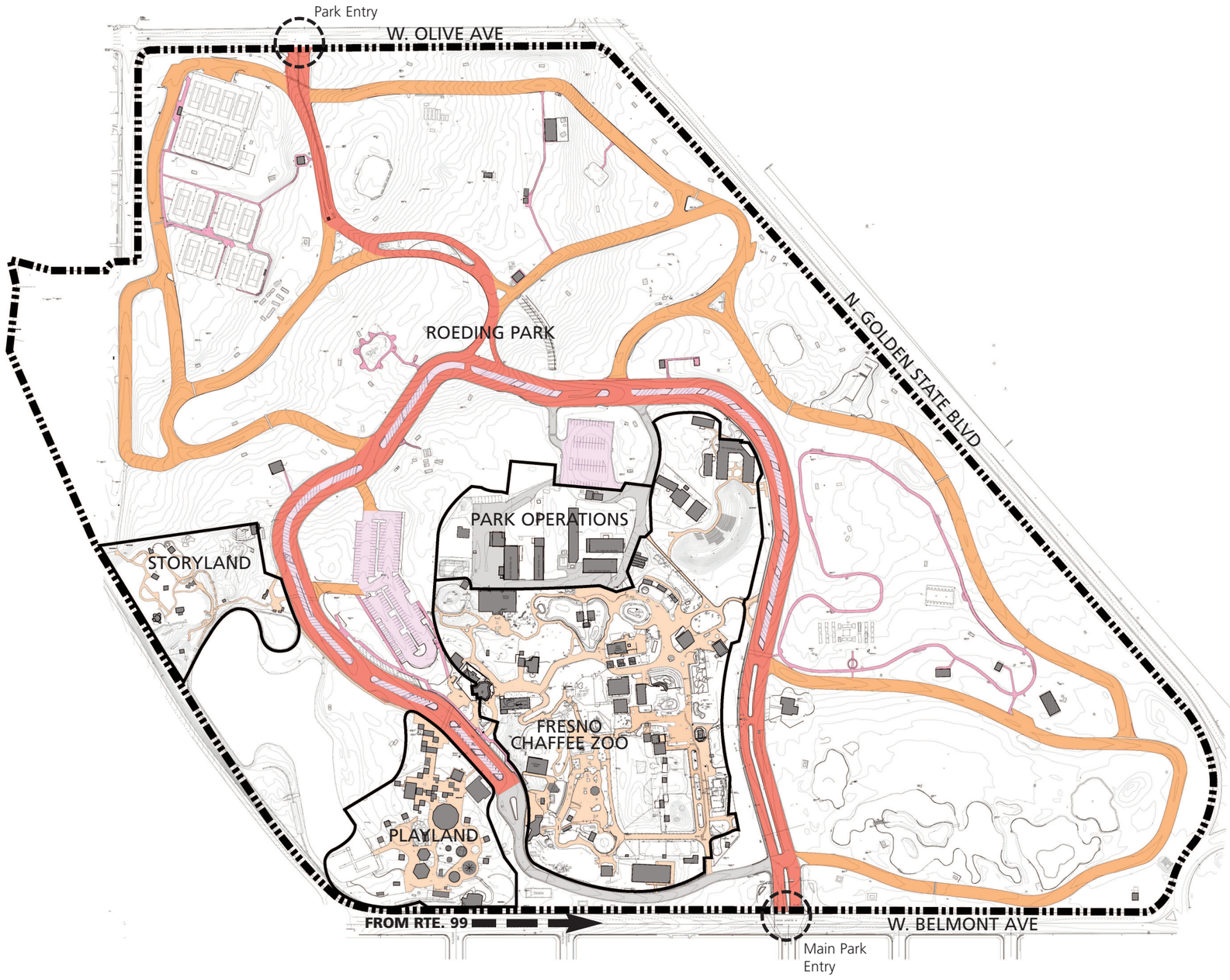
Storyland

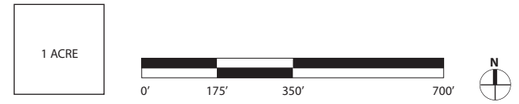


Roeding Park Land Use and Analysis
Existing Condition



Roeding Park Circulation
Existing Condition





LEGEND

- Primary Vehicular Circulation
- Secondary Vehicular Circulation
- Service Circulation
- Roeding Park Pedestrian Circulation
- Chaffee Zoo, Playland & Storyland Circulation
- Structures
- Parking

CIRCULATION ANALYSIS SUMMARY

1 Too much vehicular circulation within the Park dominates, limits optimal use of the Park.

2 Parking in center of road is not the best location.

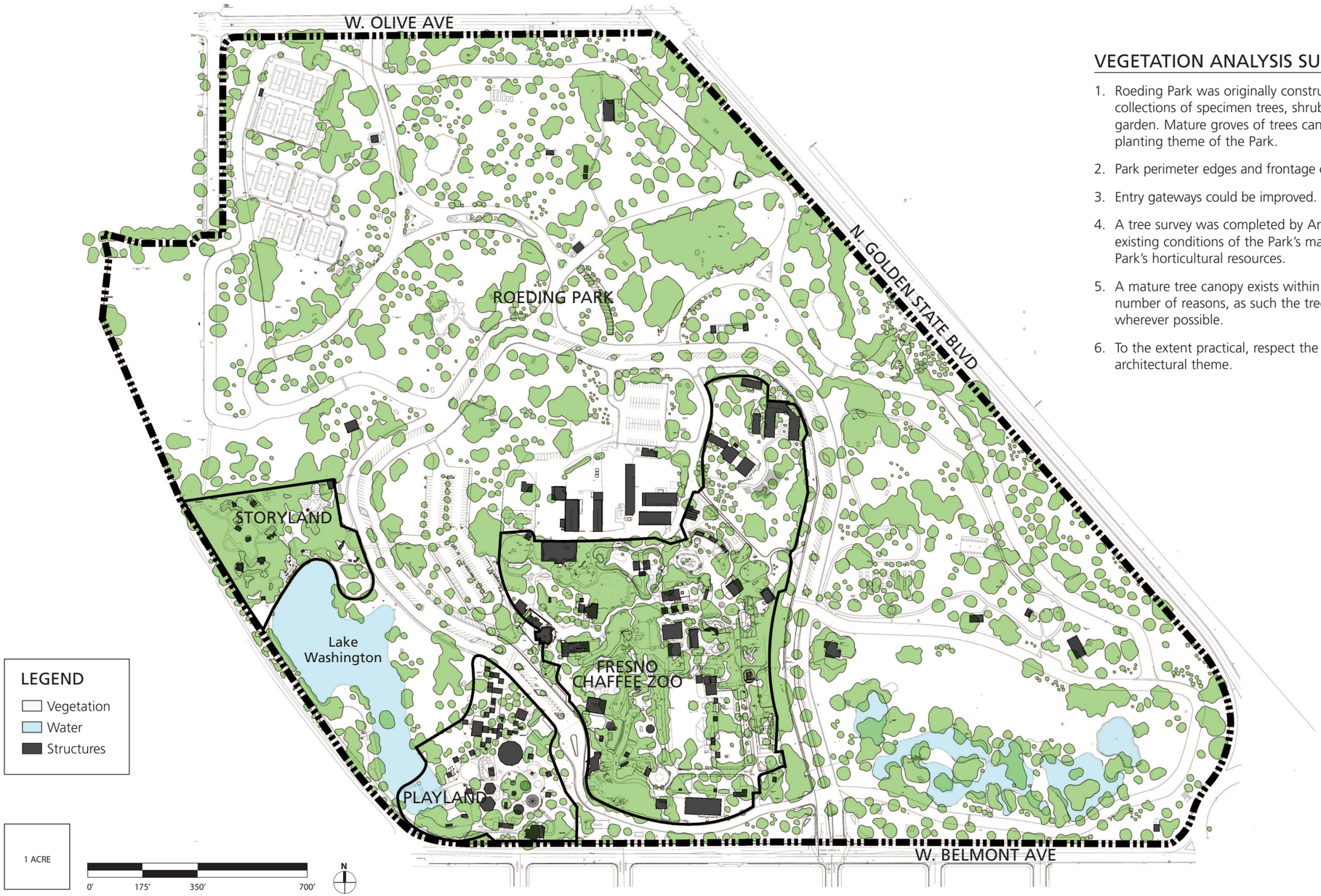
3 Existing parking distribution creates ability to park close to visitor destination, although not the best location for parking at center of primary Park roads; the distributed parking works for the Park, but a more centralized hub would work better for the Zoo, Playland and Storyland.

4 Limited pedestrian circulation.

5 Insufficient number of parking spaces.

6 Service road south of Zoo creates dead end for visitor circulation.

Roeding Park Vegetation
Existing Condition



VEGETATION ANALYSIS SUMMARY

1. Roeding Park was originally constructed in an arboretum style which is characterized by collections of specimen trees, shrubs and vines commonly referred to as a botanical garden. Mature groves of trees can be found in the Park consistent with the original planting theme of the Park.
2. Park perimeter edges and frontage could be improved.
3. Entry gateways could be improved.
4. A tree survey was completed by Arbor Pro of Portland Oregon. That report details existing conditions of the Park's major trees and will be used as a basis to protect the Park's horticultural resources.
5. A mature tree canopy exists within the Park and Zoo which is highly valuable for a number of reasons, as such the tree canopy should be protected and maintained wherever possible.
6. To the extent practical, respect the integrity of the existing Park horticultural and architectural theme.

UTILITIES

DOMESTIC WATER SYSTEM

Domestic water for the Park is provided by the City of Fresno Department of Public Utilities by way of the city's water main grid distribution system. The system is designed to provide fire flow and domestic water demand. It consists of a 12-inch and 8-inch diameter mains connected in series and looped around the Zoo periphery. These two mains are connected to a 12-inch diameter main in Belmont Avenue. This 12-inch and 8-inch looped main was constructed in 2001. The new looped water main appears to be adequate to meet the fire and domestic demand of the existing Zoo.

SANITARY SEWER SYSTEM

Sanitary sewer service for the Park is also provided by the City of Fresno. Sanitary sewer flows from the site are directed to two mains that ultimately convey the flows to the Regional Waste Water Treatment Plant (WWTP) located at Jensen Avenue and Polk Avenues. One sewer main that services the site is a 42-inch diameter pipeline that traverses the Park from north to south along the westerly boundary of the Zoo. This main accepts flows from approximately 95-percent of the site. The second main is a 10-inch diameter pipeline that conveys approximately 5-percent of the site to the east towards Golden State Boulevard and then southerly to the WWTP. The existing sewer mains are adequate to meet the peak sanitary sewer demand for the site.

STORM DRAINAGE SYSTEM

Storm drainage service for the Park is provided by the City of Fresno through the sanitary sewer system described above. This situation creates two issues for the site. The first issue is the sanitary sewer system does not have sufficient capacity to convey the peak runoff from the site that would result during rainfall intensities having a 50-percent chance of being equaled or exceeded in any given year (a rainfall intensity with a 2-year return frequency). This rainfall intensity event is often considered the minimum acceptable service level for a drainage system. The low level of service provided by the sewer mains requires that inlets restrict the amount of runoff that is allowed to enter the sewer mains. This is necessary to reduce the periods of time in which the sewer main is surcharged (flowing under pressure) due to the combination of wastewater and storm water exceeding the capacity of the sewer main. Restricting the inflow rate for on-site inlet results in short term flooding at the inlets and other locations within the Zoo during moderately intense or greater rainfall events. The second issue is that combining storm water with wastewater in sewer systems can cause surcharging of the main, which is an undesirable situation that disrupts the flow of sewer gases and can cause wastewater to backup into to service lines. Storm water in the sewer system also absorbs treatment capacity at the WWTP that is needed for wastewater. The Federal Government has encouraged the elimination of storm water connections to the sanitary sewer system when making Clean Water grants that are used to construct WWTPs. It is possible, depending on how the grants are worded, that the city could be in violation of their Clean Water grant agreements by allowing storm water from the Zoo to enter the sanitary sewer system. The existing storm drainage system that serves Park and Zoo is inadequate.

ELECTRICAL SERVICE

Background

There are between six (6) and eight (8) existing electrical services provided by Pacific Gas & Electric (PG&E) for the Park/Zoo Complex. They are distributed throughout the Complex and vary in both size and voltage. All electrical utilities are underground except at the north and west perimeters of the Park.

The largest and most centrally located service provides power to the City Yard and several Zoo buildings. According to PG&E, it is properly loaded at capacity. The other services are smaller and provide electrical power to individual facilities or buildings.

The details regarding exactly which buildings, facilities, or exhibits are fed by each service are yet to be determined.

Expansion

Because of the large number and distributed nature of the electrical services, it appears that an increased or rearranged electrical load can be served by a combination of rearranged existing and/or new services. While some costly rearrangements may be required for any increased loads, PG&E's primary electrical capacity in the area appears adequate to handle any such increase.

Upgrades to the existing electrical services will involve coordination with PG&E to determine the extent of the upgrade required. There has been in the past, and we would anticipate in the future, a desire on the part of PG&E to consolidate multiple services to a single customer into fewer individually metered services.

Coordination

Any upgrade work to the electrical services will require coordination with PG&E. In addition to involving PG&E in the construction process, we recommend engaging them in the design process, which typically requires a deposit, to help determine the best long-term path for upgrades and expansion.

We have given PG&E advance notice of pending changes at the Park/Zoo. The most economical sequence of involving PG&E in the design process is to develop the Facility Master Plan to a point which identifies estimated electrical load sizes and locations and then engage PG&E in the design process.

NATURAL GAS SERVICE

Background

The existing gas service for the Park area is provided by Pacific Gas & Electric (PG&E). According to PG&E, there are three (3) existing services across the Park. Each service is provided with low pressure gas, about ¼ pound. The existing services are likely sized appropriately for the current loads and expansion is not likely possible.

Currently, the origin of the gas service is unknown. PG&E is in the process of verifying the source and location of each service in detail.

Expansion

It appears that there are several sources for natural gas in the immediate area and there are no known limitations on the amount of growth. Upgrades to the existing gas meters and service are feasible and will involve coordination with PG&E to determine the extent of the upgrade required. This however, will be the most costly approach.

PG&E has indicated that typically, if growth in the system is needed further than 500 feet from an existing gas service, a new service will be provided.

Coordination

Any upgrade work to the gas services will require coordination with PG&E. In addition to involving PG&E in the construction process, we recommend engaging them in the design process, which typically requires a deposit, to help determine the best long-term path for upgrades and expansion.

This will require knowledge about the direction of growth for the Park and Zoo and will likely need to take place during the Concepts and Master Planning phase.

Utility Contact

Joyce Priest
Industrial Power Engineer
Pacific Gas & Electric
705 P Street
Fresno, CA 93760
Phone: (559) 263-7409
Email: jaj1@pge.com

The following are the agencies that have jurisdiction on this project; construction plans, specifications and application for services will need to be filed with the following agencies:

Water	City of Fresno
Sewer	City of Fresno
Storm Drainage	City of Fresno/FMFCD
Gas and Electrical	PG&E
Telephone and Data	Pacific Bell/AT&T

LAND USE ENTITLEMENTS

Proposed improvements to the Park require the PARCS to submit their master plan for review and apply for a CUP. The CUP should include the entire Park site. As part of the CUP application, the city required the Fresno Chaffee Zoo Corporation to prepare an Environmental Impact Report (EIR) for the project.

Various neighborhood groups will be provided the opportunity to comment on the EIR and CUP. In addition, the City of Fresno Historical Commission will also review the project in accordance with city policy. Thereafter, the project will be set for a public hearing before the Fresno City Planning Commission who will deliberate on the adequacy of the EIR and the appropriateness of granting the related CUP. The action of the Fresno City Planning Commission is a recommendation to Fresno City Council who will conduct its own public hearing on the program EIR and CUP.

After certification of the EIR and approval of the CUP, improvement plans will be prepared then submitted to the city, various regulatory agencies and others for review and approval. The project is also subject to various ministerial permits that will be granted for such activities as site grading, building construction, etc. only if those requests comply with all applicable standards.

SANITARY SEWER MASTER PLAN

The sanitary sewer master plan for Chaffee Zoo and Roeding Park is designed to provide pipeline capacity that will convey wastewater from the Park and Zoo to one of two primary collector pipelines. One collector is a 42-inch diameter pipeline that runs north-to-south through the park between the existing Zoo site and the Playland/Storyland areas. The second collector is a 10-inch diameter pipeline that runs easterly through the Park approximately 700 feet north of Belmont Avenue. These two collectors ultimately discharge into interceptor pipelines that convey wastewater to the Fresno Regional Wastewater Treatment Plant (WWTP) located at the southwest corner of Polk Avenue and Jensen Avenue.

The redevelopment of the Park and Zoo will result in the elimination of much of the existing sewer due to improper alignment and sizing of the pipe and the need to isolate the sanitary sewer system from storm water runoff, which is occurring in the existing sewer system. Approximately 9,400 lineal feet of existing sewer mainline ranging in diameter from 42-inches to 6-inches will be removed and replaced with 8,000 lineal feet of new sewer mainline. Approximately 3,400 lineal feet of existing sewer mainline with the same sizes will be retained.

Most of the site is designed to discharge into the existing or relocated 42-inch collector line. This line provides the necessary capacity for the site and downstream users. Discharge to the existing 10-inch collector was limited in order to provide capacity for downstream users.

New master plan mainline pipelines will be designed to convey the estimated average daily flow for the site with the pipe half full and the peak daily flow with a pipe 80-percent full. Velocities within the pipes will be 2 feet per second or higher during average daily flows. The flow peak daily flow rates for each of the exhibits were determined from the water use for the exhibit. The average daily flow was estimated to be one-half of the peak daily flow.

The locations of the proposed mainline sewer lines will be determined when each segment is to be constructed. Individual services to the buildings and exhibits are not shown on the master plan. They will be located and sized at the time the construction design of the particular exhibit is undertaken.

Removal and replacement of portions of the existing 42-inch collector will be required to realign the pipeline around the outside of the proposed storm drainage basin and the proposed zoo construction. This construction will need the approval of the City of Fresno Public Works Department. It will require by-pass pumping to keep the pipeline in service during the construction period. Connections to the existing and realigned portions of the 42-inch collector and the 10-inch collector will require the approval of the City of Fresno Public Works Department.

The realigned portions of the 42-inch collector will be constructed using poly-vinyl chloride (PVC) lined concrete pipe. New sewer main pipelines for the zoo may be constructed using solid wall PVC pipe that meets the City of Fresno Public Works standards. Minimum slopes on the new sewer will conform to the City of Fresno Public Works Department minimum pipe slopes. Sewer manholes will be constructed at angle points in the onsite sewer mains and at intervals not to exceed 500 feet. Cleanout will not be allowed to be used in lieu of manholes.

Storm water from the Park and Zoo will be directed to the storm water system and not to the city's sewer collection system.

Implementation of the sewer master plan will take place as different phases of the Zoo master plan are constructed. The Winged Wonders and Zoo Education buildings may have to remain connected to the existing 10-inch collector until the existing main portion of the zoo is remodeled and the new sewer main that is necessary to serve those facilities is constructed.

WATER SYSTEM MASTER PLAN

Water for the Chaffee Zoo and Roeding Park will be provided by the City of Fresno by way of the City's potable water distribution system, which consists of 14-inch water mains in Olive Avenue and in Belmont Avenue. The city's water main grid system typically provides potable water in sufficient quantities at 40 to 60 pounds per square foot (psi). The master plan water distribution system for the Park and Zoo contemplates five points of connection with the City of Fresno's potable water distribution system. Two connections are to the City's Olive Avenue water main and the remaining three are to the City's Belmont Avenue water main. One of these connections already exists resulting in four new connections. The master plan water system networks 12-inch diameter mains and 10-inch diameter mains to provide 2,000 gallons per minute fire flow with a maximum 10 psi drop from the nearest City water main to each of the nine fire hydrants on the site. Each fire hydrant has at least two connections to the City's water main system and provides overlapping coverage for a 600 foot radius around the hydrant. The master plan system will provide flow to building fire suppression systems and for domestic and landscape irrigation uses at the Zoo and the Park. Domestic uses were determined using water use records provided by the Zoo.

The connections to the City's water mains in Belmont Avenue and Olive Avenue will be made by the City of Fresno upon payment of the appropriate connection fee. Construction of the master plan water mains will require the payment of a plumbing fee to the City of Fresno. The installation of the system will be inspected by the City Plumbing Inspectors. Materials and construction standards for the installation of the system will conform to the City of Fresno Public Works standards.

Implementation of the water master plan will occur as different phases of the Zoo are constructed. Care will have to be taken at the time each phase of the Zoo is constructed to ensure that the proper water mains are constructed to provide fire protection to the sites and not exceed the maximum allowable pressure drop from the City's water main to each fire hydrant.

STORM DRAINAGE MASTER PLAN

The Park and Zoo were not included in the Fresno-Clovis Metropolitan Storm Drainage Master Plan. The Park provided drainage by draining to grassy areas, to a series of onsite ponds, and connections to the sanitary sewer system. The use of connections to the sanitary sewer system was particularly prevalent in the existing portion of the Zoo. The storm drainage master plan for the Zoo and Roeding Park contemplates a collection system that has a 2-Year event level and a disposal system that will retain the runoff from a 6-inch rainfall on the Park in its ultimate planned configuration. The collection and disposal system will meet the design requirements of the Fresno Metropolitan Flood Control District for a permanent storm drainage system. The collection system will consists of storm drain inlets and pipelines that convey runoff from the Zoo and the Park to a retention basin. The pipelines will range in size from 18-inches in diameter to 42-inches in diameter. Inlet structures will be Fresno Metropolitan Flood Control District standard curb opening inlets or their standard grate inlet. The collection system will be designed to convey runoff from the Zoo and the Park under head during at 2-Year event while providing a minimum of 1-foot of freeboard between the hydraulic grade line and the inlet elevation at all inlet locations.

Storm drainage master plan pipelines will be constructed using cast-in-place concrete pipe, pre-cast reinforced concrete pipe, or in the case of pipe sizes of 24-inches or less, high density polyethylene plastic drainage pipe. Storm drain inlets will be poured in place concrete structures with metal grates or curb openings. Storm drain manhole structures will also be poured in place concrete structures with cast iron frames and lids.

Phasing of the storm drainage master plan to match the construction of the Park and Zoo will be easily accomplished as none of the facilities that provide drainage service to the eastern expansion of the Zoo must pass through the existing Zoo. The cost to provide drainage service to the first phase of the Zoo will be relatively expensive due to the need to construct the retention basin and a large part of the collection system to provide drainage service to the first phase. Subsequent phases will reap the benefit of reduced costs to provide drainage service without impacting the City of Frenso WWTP.

GENERAL CONDTIONS

The project has retained qualified engineers, architects and planners with extensive public Park and Zoo design and construction experience. Those firms have cooperatively developed conceptual plans to serve the project infrastructure needs for the delivery of sewer, potable water, fire protection, storm drainage, electricity, gas, telephone and confimred the availability of all services.

The City of Fresno has established standards for the design, construction and maintenance of infrastructure applicable to all public improvements. All project improvements will be in compliance with City of Fresno development standards. All plans, specifications and permits will be subject to review and approval by the city and/or other regulatory agencies or entities.

As part of the project environmental and general project review process, various city departments, other regulatory agencies and utility purveyors were provided the opportunity to review and comment on the project and make recommendations and/or suggest conditions to assure adequate infrastructure is available to the project. It has been determined infrastructure is available to serve the project or must be improved or extended to meet applicable service delivery standards. All such improvements or extensions of service will occur in accordance with City of Fresno development standards.

General development conditions and ministerial permits will also apply to the project. These standards and ministerial permits have been proven effective in reducing potential environmental impacts and protecting the public health, safety and welfare.

BACKGROUND

Based on discussions with the local utility, Pacific Gas and Electric (PG&E), and electric utility maps, there are several electrical services that provide power to the Park and the Zoo. The current services are at or near capacity.

The largest existing service is a 500 KVA that is shared by the Zoo and the City Park Operations facility. It is not known how much of the service is utilized by the Zoo. The current agreement between the Zoo and the city permits the Zoo to receive water and trash services at no cost and in turn, the Zoo pays all of the electric utility costs associated with the 500 KVA electrical service.

OPTIONS CONSIDERED

The existing electrical service across the Park has little or no room for expansion. Therefore, new electrical services will be needed for the Park and Zoo and any subsequent Rotary Storyland/Playland expansions.

The feasibility of providing medium voltage service for the Zoo expansion was examined. However, since the existing services are 480/277V and below across the Park, all new infrastructure would be needed. Furthermore, the maintenance associated with a medium voltage system would necessitate periodic shutdowns of portions of the Zoo electrical system and the use of standby portable power generation. This, coupled with the limited experience of the Park and Zoo staff with maintenance of medium voltage systems make this option less feasible than the current 480/277V.

To minimize the first cost and for the ease of maintenance, a new distribution system at 480/277V, 3 phase is recommended.

UTILITY CONTACT

Alan Koobatian
Industrial Power Engineer
Pacific Gas & Electric
705 P Street
Fresno, CA 93760
Phone: (559) 263-7409

NEW SERVICES AND ELECTRICAL REQUIREMENTS

A minimum of three services are identified for the Zoo and the Park. Each of the services will serve a large and different area of the Zoo and surrounding Park. Each service will serve a group of individual buildings directly. Electrical feeders will be routed underground between a service switchboard and one 480/277V, 3 phase panelboard in the electrical room in each building to serve lighting loads and mechanical equipment. Electrical rooms will also contain a step down transformer and at least one 120/208V, 3 phase panelboard to supply other loads.

The existing City Park Operations facility will remain connected to the existing service. Once the City Park Operations is relocated out of the Park area, this service will be removed.

PARK ELECTRICAL SERVICE 1

One 2500KVA service located between the Administration building and Education Center will feed the Diversity of Life and Education Center, Sea Lion Exhibit, Entry Village & Asia Panorama, Children's Zone, Administration Hub (at Entry Village), Event Hub and Gardens, Golden State Boulevard Entry and Park Boulevard, and Parking Hub. These areas have an estimated load of 2497 KVA.

Diversity of Life and Education Center			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Classrooms, Offices, and Support	12000	20	240
Exhibit Pavilion 1	5000	30	150
Plazas, Courtyards, Site Furnishings	10000	1	10
Estimated Power Requirements (KVA)			**400**

Sea Lion Exhibit			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Outdoor Sea Lion Exhibit	4000	20	80
Birds & Other Aquatics	2500	20	50
Holding and Support	2200	20	44
Plazas, Courtyards, Site Furnishings	4500	1	4.5
Estimated Power Requirements (KVA)			**178.5**

Entry Village & Asia Panorama			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Gift Shop & Support	7000	20	140
Ticketing, Membership, Guest Services	4000	20	80
Entry Plaza	30000	1	30
Zoo Plaza	22500	1	22.5
Exhibit Panorama	16000	5	80
Estimated Power Requirements (KVA)			**352.5**

Children's Zone			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Tree House Play & Exhibits	1		15
Carousel	1		75
Tot Train	1		15
Contact Yard & Barns	10000	2	20
Kid's Show	6500	15	97.5
Splash Zone	1200	10	12
Snack Coffee & Ice Cream Station	1000	20	20
Plazas, Site Furnishings, Play Moguls	15000	1	15
Estimated Power Requirements (KVA)			**269.5**

Administration Hub (at Entry Village)			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Administration and Surrounding Area	15000	20	300
Estimated Power Requirements (KVA)			**300**

Event Hub & Gardens			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Event Hub - Facilities	15000	20	300
Event Hub - Catering Kitchen	5000	25	125
Event Lawn	50000	0.2	10
Estimated Power Requirements (KVA)			**435**

Golden State Entry & Boulevard			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Golden State Entry			10
Boulevard	234000	0.2	46.8
Furnishings/Lighting/Landscape	100000	0.5	50
Estimated Power Requirements (KVA)			**106.8**

Parking Hub			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Parking Paving	350000	0.2	70
Paths, Landscape, Tree Protection	200000	0.2	40
Estimated Power Requirements (KVA)			**110**

ZOO ELECTRICAL SERVICE 2

One 1500KVA service located to the west of Rainforest Aviaries and Exhibit Pavilion will feed the Grasslands and Waterhole & Central Café – Phase 1 and 2, Asia Archipelago Expansion, and Rainforest Aviaries & Exhibit Pavilion. These areas have an estimated load of 1329 KVA.

Grasslands and Waterhole & Central Café - Phase 1			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Café	7600	20	152
Grasslands Phase 1 - Waterhole	45000	2	90
Giraffe feeding Station	1		35
Plazas, Promenades, Site Furnishings	25000	1	25
Estimated Power Requirements (KVA)			**302**

Grasslands and Waterhole & Central Café - Phase 2			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Mixed Species Habitats	50000	0.5	25
Holding Barns - Hoofstock	3000	10	30
Holding Barns - Rhino, others	4000	10	40
View/Shade Structure	2500	1	2.5
Paths, Roads, Site Furnishings	12000	1	12
Estimated Power Requirements (KVA)			**109.5**

Asia Archipelago Expansion			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Elephant / Tapir Expansion	25000	1	25
Asia Expansion Holding Barn	5000	20	100
Orangutan Habitat Expansion	2500	10	25
Tiger Habitat Expansion	3000	10	30
View/Shade Structures	1500	20	30
Paths, Roads, Site Furnishings	20000	1	20
Estimated Power Requirements (KVA)			**230**

Rainforest Aviaries & Exhibit Pavilion			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Exhibit Pavilion	15000	40	600
Outdoor Mesh Exhibits	8000	0.5	4
Snack Café & Seasonal Gift	3500	20	70
View/Shade Structures	3000	1	3
Paths, Decks, Roads, Site Furnishings	10000	1	10
Estimated Power Requirements (KVA)			**687**

ZOO ELECTRICAL SERVICE 3

One 1500KVA service located to the North of Commissary Building will feed the Safari Trail Phase 1 and Phase 2, Show Amphitheater, and Zoo Operations & Maintenance – Phase 1 and 2. These areas have an estimated load of 1410 KVA.

Safari Trail Phase 1: Predators			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Predator Habitats	100000	0.5	50
Predator Holding Buildings	5500	10	55
View/Shade Structure	2200	1	2.2
Paths, Roads, Site Furnishings	20000	1	20
Estimated Power Requirements (KVA)			**127.2**

Safari Trail Phase 2: Primates & Hub			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Indoor Exhibit Facility	3500	20	70
Snack Café & Seasonal Gift	3500	20	70
Outdoor Habitat	75000	0.5	37.5
Holding Buildings	5500	10	55
View/Shade Structures	2500	1	2.5
Paths, Decks, Roads, Site Furnishings	10000	1	10
Estimated Power Requirements (KVA)			**245**

Show Amphitheater			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Amphitheater and Surrounding Area	65000	5	325
Estimated Power Requirements (KVA)			**325**

Zoo Operations & Maintenance - Phase 1			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Maintenance Barn	5000	15	75
Maintenance Yard	22500	1	22.5
Commissary & Warehouse	8000	15	120
Offices, Restrooms, Support	7500	20	150
Quarantine Facility	4000	15	60
Outdoor Pens	2000	1	2
Paving/Yards, Storage Bins, Parking	15000	1	15
Estimated Power Requirements (KVA)			**444.5**

Zoo Operations & Maintenance - Phase 2			
	Net Area (sf)	Watts/sf	Total Watts (KVA)
Propagation 1	8000	5	40
Horticulture Greenhouses	9000	20	180
Horticulture Nursery/Support	2000	20	40
Paving, Storage Bins	7500	1	7.5
Estimated Power Requirements (KVA)			**267.5**

BACKGROUND

The existing gas service for the Roeding Park area is provided by the local utility, Pacific Gas & Electric (PG&E). According to PG&E, there are three (3) existing services across the Park. Each service is provided with low-pressure gas, about ¼ pound.

OPTIONS FOR GROWTH

There is a main gas transmission line along West Belmont Avenue that is maintained at 60 psi or greater, so there are no known limitations on the amount of growth for the Zoo and the Park overall.

It is recommended that natural gas services for the Park expansion be provided at medium pressure to provide flexibility in pipe routing from the gas meters to each building. Medium pressure service will also facilitate modifications to the site and building gas piping for future expansions and modernizations.

It is recommended that new gas piping be provided for all of the buildings and facilities at the Park. Due to the phased approach of the planned expansion, it will be necessary to maintain existing gas service to the entire Zoo while new buildings and facilities are under construction. Furthermore, the location of much of the existing gas piping between the meters and the existing facilities is unknown. Finally, Zoo maintenance staff have indicated that the condition of the existing underground gas piping is poor and much that has been uncovered or modified in recent years is in need of replacement.

PG&E has indicated that typically, if growth in the system is needed further than 500 feet from an existing gas service, a new service will be provided. Depending upon the final layout of the gas piping for each designated service, PG&E may elect to upgrade service or provide new service. In either case, it appears that maintaining operation to the existing Zoo facilities will require all new piping from West Belmont Avenue to the existing and new meters.

COORDINATION

Any new or upgrade work will require coordination with PG&E. In addition to involving PG&E in the construction process, it is recommended that the designers engage them early in the design process. The coordination and implementation process can often take several months to complete and involving the utility early can mitigate impacts to the project schedule during construction.

UTILITY CONTACT

Alan Koobatian
Industrial Power Engineer
Pacific Gas & Electric
705 P Street
Fresno, CA 93760
Phone: (559) 263-7409

NEW NATURAL GAS SERVICE REQUIREMENTS

A minimum of three services are identified for the Zoo and the Park. Each of the services will serve a large and different area of the Zoo and surrounding Park. Each service will serve a group of individual buildings directly.

It is recommended that any new gas meters be located near the electrical service for ease of installation and maintenance. Gas piping will be routed underground between the main piping header at the gas meter and each building. A pressure regulator, if medium pressure is provided, and shutoff valve will be provided near an exterior wall of each building.

ZOO NATURAL GAS SERVICE 1

One 5550 MBH service located between the Administration building and Education Center will feed the Diversity of Life and Education Center, Sea Lion Exhibit, Entry Village & Asia Panorama, Children's Zone, Administration Hub (at Entry Village), and Event Hub & Gardens. These areas have an estimated load of 5542 MBH.

Diversity of Life and Education Center			
	Net Area (sf)	Btuh/SF	Total (MBH)
Classrooms, Offices, and Support	12000	45	540
Exhibit Pavilion 1	5000	60	300
Plazas, Courtyards, Site Furnishings	10000		0
Estimated Natural Gas Requirements (MBH)			**840**

Sea Lion Exhibit			
	Net Area (sf)	Btuh/SF	Total (MBH)
Outdoor Sea Lion Exhibit	4000		0
Birds & Other Aquatics	2500	60	150
Holding and Support	2200	60	132
Plazas, Courtyards, Site Furnishings	4500		0
Estimated Natural Gas Requirements (MBH)			**282**

Entry Village & Asia Panorama			
	Net Area (sf)	Btuh/SF	Total (MBH)
Gift Shop & Support	7000	45	315
Ticketing, Membership, Guest Services	4000	45	180
Entry Plaza	30000		0
Zoo Plaza	22500		0
Exhibit Panorama	16000		0
Estimated Natural Gas Requirements (MBH)			**495**

Children's Zone			
	Net Area (sf)	Btuh/SF	Total (MBH)
Tree House Play & Exhibits	1		15
Carousel	1		75
Tot Train	1		15
Contact Yard & Barns	10000	60	600
Kid's Show	6500		0
Splash Zone	1200		0
Snack Coffee & Ice Cream Station	1000	45	45
Plazas, Site Furnishings, Play Moguls	15000		0
Estimated Natural Gas Requirements (MBH)			**750**

Administration Hub (at Entry Village)			
	Net Area (sf)	Btuh/SF	Total (MBH)
Administration and Surrounding Area	15000	45	675
Estimated Natural Gas Requirements (MBH)			**675**

Event Hub & Gardens			
	Net Area (sf)	Btuh/SF	Total (MBH)
Event Hub - Facilities	15000	60	900
Event Hub - Catering Kitchen	5000	200	1000
Event Lawn	50000		0
Estimated Natural Gas Requirements (MBH)			**1900**

ZOO NATURAL GAS SERVICE 2

One 2270 MBH service located to the west of Rainforest Aviaries and Exhibit Pavilion will feed the Grasslands and Waterhole & Central Café - Phase 1 and 2, Asia Archipelago Expansion, and Rainforest Aviaries & Exhibit Pavilion. These areas have an estimated load of 2269 MBH.

Grasslands and Waterhole & Central Café - Phase 1			
	Net Area (sf)	Btuh/SF	Total (MBH)
Café	7600	60	456
Grasslands Phase 1 - Waterhole	45000		0
Giraffe feeding Station	1		35
Plazas, Promenades, Site Furnishings	25000		0
Estimated Natural Gas Requirements (MBH)			**491**

Grasslands and Waterhole & Central Café - Phase 2			
	Net Area (sf)	Btuh/SF	Total (MBH)
Mixed Species Habitats	50000		0
Holding Barns - Hoofstock	3000	60	180
Holding Barns - Rhino, others	4000	60	240
View/Shade Structure	2500		0
Paths, Roads, Site Furnishings	12000		0
Estimated Natural Gas Requirements (MBH)			**420**

Asia Archipelago Expansion			
	Net Area (sf)	Btuh/SF	Total (MBH)
Elephant / Tapir Expansion	25000		0
Asia Expansion Holding Barn	5000	60	300
Orangutan Habitat Expansion	2500		0
Tiger Habitat Expansion	3000		0
View/Shade Structures	1500		0
Paths, Roads, Site Furnishings	20000		0
Estimated Natural Gas Requirements (MBH)			**300**

Rainforest Aviaries & Exhibit Pavilion			
	Net Area (sf)	Btuh/SF	Total (MBH)
Exhibit Pavilion	15000	60	900
Outdoor Mesh Exhibits	8000		0
Snack Café & Seasonal Gift	3500	45	158
View/Shade Structures	3000		0
Paths, Decks, Roads, Site Furnishings	10000		0
Estimated Natural Gas Requirements (MBH)			**1058**

ZOO NATURAL GAS SERVICE 3

One 2890 MBH service located to the North of Commissary Building will feed the Safari Trail Phase 1 and Phase 2, and Zoo Operations & Maintenance – Phase 1 and Phase 2. These areas have an estimated load of 2886 MBH.

Safari Trail Phase 1: Predators			
	Net Area (sf)	Btuh/SF	Total (MBH)
Predator Habitats	100000		0
Predator Holding Buildings	5500	60	330
View/Shade Structure	2200		0
Paths, Roads, Site Furnishings	20000		0
Estimated Natural Gas Requirements (MBH)			**330**

Safari Trail Phase 2: Primates & Hub			
	Net Area (sf)	Btuh/SF	Total (MBH)
Indoor Exhibit Facility	3500	60	210
Snack Café & Seasonal Gift	3500	45	158
Outdoor Habitat	75000		0
Holding Buildings	5500	60	330
View/Shade Structures	2500		0
Paths, Decks, Roads, Site Furnishings	10000		0
Estimated Natural Gas Requirements (MBH)			**698**

Zoo Operations & Maintenance - Phase 1			
	Net Area (sf)	Btuh/SF	Total (MBH)
Maintenance Barn	5000	60	300
Maintenance Yard	22500		0
Commissary & Warehouse	8000	100	800
Offices, Restrooms, Support	7500	45	338
Quarantine Facility	4000	60	240
Outdoor Pens	2000		0
Paving/Yards, Storage Bins, Parking	15000		0
Estimated Natural Gas Requirements (MBH)			**1678**

Zoo Operations & Maintenance - Phase 2			
	Net Area (sf)	Btuh/SF	Total (MBH)
Propagation 1	8000		0
Horticulture Greenhouses	9000	10	90
Horticulture Nursery/Support	2000	45	90
Paving, Storage Bins	7500		0
Estimated Natural Gas Requirements (MBH)			**180**

APPENDIX

Conceptual Architecture and Site Imagery

PUBLIC SPACE

The following reference photos depict some of the key site and architectural concepts being proposed at the Park and Zoo. The proposed Park Promenades and the main Zoo Promenade are envisioned to include many of those architectural elements typically found at some of the great public spaces. Architectural elements such as landscaping, paving, sculpture, fountains, seat walls, benches, ornamental pedestrian scale lighting, signage, drinking fountains, and fencing could all be of a similar look and feel, which would help unify the Park and Zoo circulation systems. An informal, rhythmic organization of trees and border plantings flanking the edges of the promenades and plazas is proposed to reinforce the circulation patterns, create a sense of "scale", provide visual interest and provide shade. The proposed plaza hubs including the Park Plaza Hub, the Zoo Entry Village and the Zoo Central Plaza Hub could include all of the architectural elements noted above, and also include guest amenities such as retail, restrooms, food/coffee/snack, tables and chairs and more.

Central Park, New York City

Oaxaca, Mexico

Oaxaca, Mexico

Oaxaca, Mexico

Garden at Balboa Park

Land Use Quantities

Existing and Proposed Land Use Quantities

Summary

Use	Land Area[a]			
	Proposed		Existing	
Roeding Park	100 acres	68%	123 acres	83%
Fresno Chaffee Zoo	39 acres	26%	18 acres	12%
Rotary Playland & Storyland	9 acres	6%	7 acres	5%
Totals	148 acres		148 acres	

Details

Roeding Park

Use	Land Area[a]			
	Proposed		Existing	
Public Access Roads[b]	5 acres	5%	11 acres	9%
Non-Public Access Road	2 acres	2%	0 acres	0%
Multiple Purpose Paths (Pedestrian/Bike)	6 acres	6%	0 acres	0%
Parking[b]	9 acres	9%	3 acres	2%
Public Recreation/Open Space[c]	76 acres	76%	104 acres	85%
PARCS Maintenance Yard[d]	2 acres	2%	5 acres	4%
Totals	100 acres		123 acres	

Fresno Chaffee Zoo

Use	Land Area[a]			
	Proposed		Existing	
Non-Public Access Roads	1 acre	3%	1 acre	6%
Multiple Purpose Paths (Pedestrian/Bike)	5 acres	13%	3 acres	17%
Exhibits including habitat	20 acres	51%	4 acres	22%
Buildings	3 acres	7%	2 acres	11%
Landscape/Open Space	10 acres	26%	8 acres	44%
Totals	39 acres		18 acres	

Rotary Storyland and Playland

Use	Land Area[a]			
	Proposed		Existing	
All	9	100%	7	100%
Totals	9		7	

[a]All acreages are rounded to the nearest whole acre.

[b]Portions of the land area assigned to Roeding Park for roads and parking would be jointly used by the Park, Fresno Chaffee Zoo and Rotary Storyland and Playland.

[c] Lake Washington and public picnic area are included as public recreation open space.

[d] The specific land area required for the new Roeding Park maintenance yard has not been determined, but should not exceed 1 to 2 acres.

LEGEND

- Illustrative Proposed Site Boundaries

BUILDING
- Visitor Service Facility
- Exhibit Facility
- Animal Holding & Support Facility
- Zoo Service & Operations Facility

CIRCULATION
- Primary Zoo Path & Plazas
- Entry Plazas & Promenades
- Park Plaza & Promenades
- Vehicular Circulation, Parking & Service

SITE
- Animal Exhibits
- Zoo Buffer
- Park Landscape

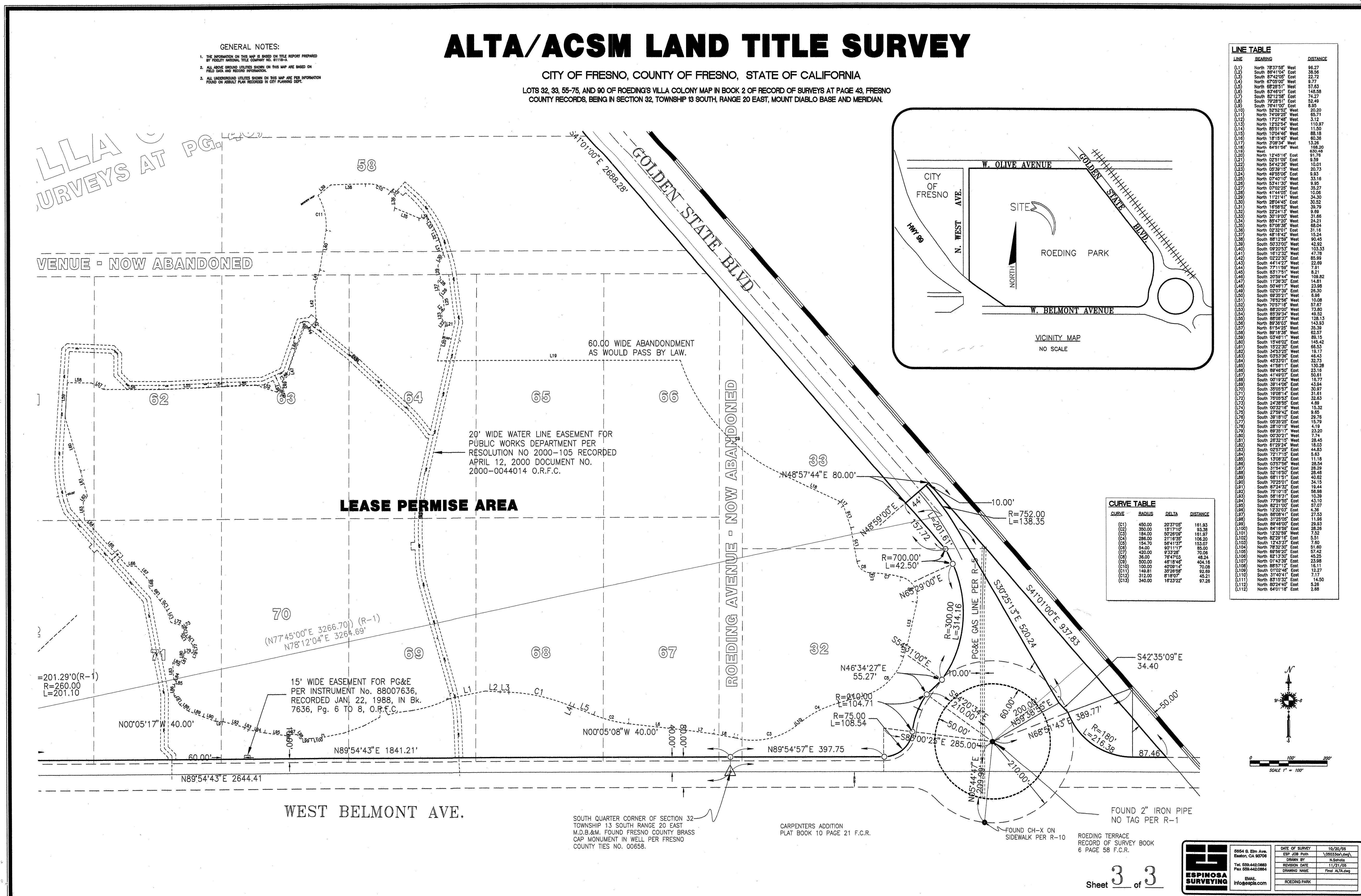
ALTA/ACSM LAND TITLE SURVEY

CITY OF FRESNO, COUNTY OF FRESNO, STATE OF CALIFORNIA

LOTS 32, 33, 55-75, AND 90 OF ROEDING'S VILLA COLONY MAP IN BOOK 2 OF RECORD OF SURVEYS AT PAGE 43, FRESNO COUNTY RECORDS, BEING IN SECTION 32, TOWNSHIP 13 SOUTH, RANGE 20 EAST, MOUNT DIABLO BASE AND MERIDIAN.

GENERAL NOTES:

1. THE INFORMATION ON THIS MAP IS BASED ON TITLE REPORT PREPARED BY FIDELITY NATIONAL TITLE COMPANY NO. 61118-A
2. ALL ABOVE GROUND UTILITIES SHOWN ON THIS MAP ARE BASED ON FIELD DATA AND RECORD INFORMATION.
3. ALL UNDERGROUND UTILITIES SHOWN ON THIS MAP ARE PER INFORMATION FOUND ON ASBUILT PLAN RECORDED IN CITY PLANNING DEPT.



CURVE TABLE

CURVE	RADIUS	DELTA	DISTANCE
(C1)	450.00	20°37'05"	161.93
(C2)	350.00	15°17'10"	93.38
(C3)	184.00	50°26'09"	161.97
(C4)	286.00	21°16'35"	106.20
(C5)	154.70	56°41'37"	153.07
(C6)	54.00	90°11'17"	85.00
(C7)	420.00	9°33'28"	70.06
(C8)	36.00	76°47'03	48.24
(C9)	500.00	46°18'46"	404.16
(C10)	100.00	40°09'14"	70.08
(C11)	149.81	35°26'58"	92.69
(C12)	312.00	8°18'07"	45.21
(C13)	340.00	16°23'22"	97.26

LINE TABLE

LINE	BEARING	DISTANCE
(L1)	North 78°37'58" West	96.27
(L2)	South 86°41'04" East	38.56
(L3)	South 87°42'05" East	22.72
(L4)	North 67°05'00" West	9.77
(L5)	North 68°28'51" West	57.63
(L6)	South 83°46'01" East	148.58
(L7)	South 82°12'58" East	74.27
(L8)	South 79°28'51" East	52.49
(L9)	South 76°41'00" East	8.95
(L10)	North 52°52'52" West	20.20
(L11)	North 74°09'25" West	65.71
(L12)	North 17°27'48" West	3.12
(L13)	North 12°52'54" West	110.97
(L14)	North 85°51'49" West	11.50
(L15)	North 10°04'46" West	88.18
(L16)	North 18°15'45" West	60.36
(L17)	North 3°08'34" West	13.26
(L18)	North 64°51'56" West	168.20
(L19)	West	630.48
(L20)	North 12°45'16" East	91.76
(L21)	North 02°51'09" East	9.59
(L22)	North 54°42'36" West	10.01
(L23)	North 05°39'15" West	20.73
(L24)	North 49°55'06" East	9.93
(L25)	North 07°40'10" West	33.16
(L26)	North 53°41'30" West	9.95
(L27)	North 07°02'25" West	35.27
(L28)	North 41°44'05" East	10.06
(L29)	North 11°21'41" West	34.30
(L30)	North 28°04'45" East	30.52
(L31)	North 16°58'52" West	39.79
(L32)	North 22°24'13" West	9.69
(L33)	North 30°19'00" West	31.66
(L34)	North 85°47'20" West	24.21
(L35)	North 67°08'38" West	68.04
(L36)	North 02°32'01" East	31.16
(L37)	North 48°16'42" West	15.24
(L38)	South 88°12'59" West	90.45
(L39)	South 50°33'00" West	42.92
(L40)	South 09°20'53" West	103.33
(L41)	South 16°12'32" West	47.78
(L42)	South 02°22'30" East	85.99
(L43)	South 44°14'27" West	22.69
(L44)	South 77°11'59" West	7.91
(L45)	South 83°17'51" West	8.21
(L46)	South 20°59'44" West	109.82
(L47)	South 11°36'30" East	14.81
(L48)	South 50°46'17" West	23.98
(L49)	South 02°07'39" East	26.30
(L50)	South 69°35'21" West	6.96
(L51)	South 76°52'56" West	10.08
(L52)	North 70°57'18" West	57.67
(L53)	South 88°20'00" West	73.80
(L54)	South 85°39'34" West	49.52
(L55)	South 88°08'37" West	128.13
(L56)	North 89°36'03" West	143.93
(L57)	North 61°54'25" West	35.39
(L58)	North 89°18'38" West	62.57
(L59)	South 03°46'11" West	89.15
(L60)	South 15°46'02" East	145.42
(L61)	South 15°22'30" East	66.53
(L62)	South 34°53'25" West	19.17
(L63)	South 03°53'36" East	46.43
(L64)	South 45°33'01" East	32.73
(L65)	South 41°58'11" East	130.28
(L66)	South 89°46'50" East	23.16
(L67)	South 41°49'07" East	50.61
(L68)	South 00°19'32" West	16.77
(L69)	South 39°14'06" East	43.94
(L70)	South 35°05'57" East	30.97
(L71)	South 19°08'14" East	31.61
(L72)	South 75°05'53" East	32.63
(L73)	South 24°38'55" East	4.69
(L74)	South 00°32'16" West	15.32
(L75)	South 27°59'42" East	9.65
(L76)	South 39°18'10" East	29.76
(L77)	South 05°35'25" East	15.79
(L78)	South 28°10'19" West	4.19
(L79)	South 89°35'17" West	23.20
(L80)	South 00°30'21" West	7.74
(L81)	South 26°32'15" West	28.45
(L82)	North 61°29'24" West	18.03
(L83)	South 02°57'29" East	44.83
(L84)	South 72°17'15" East	5.63
(L85)	South 13°08'32" East	11.18
(L86)	South 03°57'56" West	28.54
(L87)	South 31°54'42" East	28.29
(L88)	South 52°16'50" East	28.48
(L89)	South 68°11'51" East	40.62
(L90)	South 70°25'01" East	34.15
(L91)	South 87°24'32" East	19.44
(L92)	South 75°10'15" East	58.98
(L93)	South 58°16'31" East	10.39
(L94)	South 77°59'55" East	43.10
(L95)	South 82°21'00" East	57.07
(L96)	North 12°32'03" East	4.36
(L97)	South 86°08'41" East	27.53
(L98)	South 31°25'05" East	11.96
(L99)	South 89°46'00" East	29.93
(L100)	South 84°16'59" East	28.26
(L101)	North 12°32'59" West	7.52
(L102)	North 82°29'16" East	5.51
(L103)	South 12°43'37" East	7.60
(L104)	North 78°32'30" East	51.60
(L105)	North 69°56'20" East	57.42
(L106)	North 62°13'30" East	45.25
(L107)	North 01°43'39" East	23.98
(L108)	North 88°57'12" East	16.11
(L109)	South 01°02'48" East	12.27
(L110)	South 31°40'41" East	7.17
(L111)	North 83°15'32" East	14.50
(L112)	North 80°24'40" East	5.26
(L112)	North 64°01'18" East	2.68

Sheet 3 of 3

ESPINOSA SURVEYING
5654 S. Elm Ave.
Easton, CA 93706
Tel. 559.442.0883
Fax 559.442.0884
EMAIL info@espls.com

DATE OF SURVEY	10/20/05
ESP JOB Path	\05033ax\dwg\
DRAWN BY	N.Sahota
REVISION DATE	11/21/05
DRAWING NAME	Final ALTA.dwg
ROEDING PARK	